

FINAL ENVIRONMENTAL ASSESSMENT REPORT (FEAR)
for
TRANSMISSION AND DISTRIBUTION (T&D) NETWORK
In
**Dhalai, Unakoti & North Tripura Districts Under “North Eastern Region Power System
Improvement Project (NERPSIP) Tranche-1”, Tripura**



GCI/V/PGCIL/TRIPURA/R3/FEAR/02



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For
TRIPURA STATE ELECTRICITY CORPORATION LIMITED (TSECL)
(A Government of Tripura Enterprise)

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FEAR II – Revision 3 –October 1, 2021

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ABBREVIATIONS

ADC	Autonomous District Council
PAPs	Project Affected Persons
AP	Angle Point
ASI	Archaeological Survey of India
CBIS	Capacity Building & Institutional Strengthening
CEA	Central Electricity Authority
CPTD	Compensation Plan for Temporary Damages
CPIU	Central Project Implementation Unit
dB	Decibel
DC	District Collector
DL	Distribution Line
E&S	Environmental and Social
EHS	Environment, Health & Safety
EHV	Extra High Voltage
EMF	Electro Magnetic Field
ESMC	Environment & Social Management Cell
ESPPF	Environment and Social Policy & Procedures Framework
EMP	Environmental Management Plan
EP	Electric Pole
FCA,1980	Forest (Conservation) Act, 1980
FEAR	Final Environment Assessment Report
GCC	General Conditions of Contract
GCI	Green Circle Inc
GIS	Geographic Information System
GPS	Global Positioning System
GOI	Government of India
GoT	Government of Tripura
GRM	Grievances Redressal Mechanism
GRC	Grievance Redressal Committee
HFL	Highest Flood Level
IA	Implementing Agency
IBA	Important Bird Areas
IEAR	Initial Environmental Assessment Report
IP	Indigenous People
IUCN	International Union for Conservation of Nature
MoEF&CC	Ministry of Environment, Forest and Climate Change
NEEPCO	North Eastern Electric Power Corporation Limited
LOA	Letter of Award
NOC	No Objection Certificate
NER	North Eastern Region
NERPSIP	North Eastern Region Power System Improvement Project
NHPC	National Hydroelectric Power Corporation
O & M	Operation & Maintenance
OPs	Operational Policies
PCB	Poly Chlorinated Biphenyl
PCR	Physical Cultural Resources
PIU	Project Implementation Unit
POWERGRID	Power Grid Corporation of India Ltd.
PPEs	Personal Protective Equipment

PMU	Project Management Unit
PTCC	Power Telecom Co-ordination Committee
RoW	Right of Way
R & R	Rehabilitation and Resettlement
RRM	Random Rubble Masonry
SMF	Social Management Framework
S/S	Substation
SPCU	State Project Coordination Unit
T & D	Transmission & Distribution (T&D)
TL	Transmission Line
TSECL	Tripura State Electricity Corporation Limited
TT	Transmission Tower
WB	World Bank

WEIGHTS & MEASURES

GW	Giga Watt
Km	Kilometer
kV	kilovolt
kW	kilowatt
MVA	Megavolt Ampere
MW	Megawatt
Sq.mm.	Square millimeter

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EXECUTIVE SUMMARY

North Eastern Region Power Supply Improvement Project (NERPSIP) is a World Bank (WB) funded project aimed at improving the impoverished power transmission and distribution (T&D) system in the North Eastern states of India, which is being implemented by Power Grid Corporation of India Ltd. (POWERGRID), the single transmission utility of the country as the implementing agency (IA). Although the present T&D system covers many areas of the State, it is inadequate in its reach and due to non-availability of redundant T&D system, breakdown of any transmission system element results in long term power shortages making the system highly unreliable.

The present Final Environment Assessment Report (FEAR) II is for the part of priority works of strengthening of T&D System under Tranche-1 of NERSIP in Dhalai, North Tripura & Unakoti districts of Tripura State. FEAR II is associated with the construction of 2 nos 132/33kV Transmission Lines (TLs), 5 nos 33 kV Distribution Lines (DLs), 2 nos 132/33 kV transmission substations S/S and 8 Nos 33/11 kV distribution S/S. FEAR is undertaken to verify the actual location details of the project elements, identify possible environmental and social issues, to report any effects on the biodiversity of the region / protected area (PA), identification of the project affected people (PAP) and to assess the compliance of the Initial Environmental Assessment Report (IEAR) / Environment Management Plan (EMP) prepared and submitted by the IA. The elements / scope of the FEAR II include:

Transmission Lines (TL)

- Kailasahar -Dharmanagar 132 kV D/C line - 21.916 Km
- LILO of 132 Ambassa-PK Bari line at Manu S/S - 1.175 Km
- 132 KV Interconnection from old Manu S/S to New Manu S/S at for charging of 132 KV S/C Manu to Chawmanu - 3.310km

Distribution Line (DL)

- Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line - 5.186 Km
- *Jawahar Nagar (New) - 33/11 kV Dhumachhera (new) 33 kV line - 23 Km
- 132/33 kV Manu (New) - 33/11 kV Dhumachhera (New) 33kV line - 6.628 Km
- 132/33 kV Manu (New) - 33/11kV 82 Mile (new) 33 kV line - 15.192 Km
- 132/33 kV PK Bari (Existing) -33/11 kV 82 Mile (New) 33 kV line - 8.094 Km
- **Kailasahar (Existing) - 33/11kV Tilla Bazar (New) 33 kV line - 8.2 Km
- **Durgachowmohni (new) - LILO of Salema- Kamalpur 33 kV line - 4.5 Km
- 33/11kV Challengta (New) - LILO point of Chamanu-Manu Line - 1.829 Km

***Presented in Addendum I as per suggestion of WB because the line details are received in November 2021.**

****Route yet be approved. Hence survey not done on site and data is not available. Hence the line is not considered in FEAR.**

Tripura, is located in the north eastern part of the country and shares international border with Bangladesh from three sides. The area of the State is 10,491 Sq.km which forms 0.32% of country's geographical area. The State lies between latitude 22°57' N and 24°33' N and longitude 91°10' and 92°20' E in NER physiographic zone. The recorded forest area of the

State is 6,294 sq. km which constitutes 60% of its geographical area. Reserved forests (RF) constitute 66.33%, protected forests (PF) constitute 2% and unclassed forests (UCF) constitute 33.64%. The biological diversity of any geographical region is estimated at the level of ecosystem diversity, species diversity and genetic diversity. Tripura being a part of NER, belongs to one of the two “Hot Spot” of India amongst 18 identified in the World.

The terrain of the project districts is 50% to 60 % hilly and slopy and 40 to 50% plain through which the TLs and DLs are crossing. All the S/S are planned on plain land parcels. In case tower/pole locations are on hill terrain and where ever positioning of tower on hill top is not possible leg extension is being utilized so as to minimize/ avoid benching/ revetment and to provide great stability.

The proposed project activities include the detailed survey for finalizing the route alignment, and installation of TLs and DLs and construction of S/S (civil and electrical installation). Lattice poles are then being erected on designated places using normal excavation and foundations thereafter conductors are strung across these using manual/stringing machines. The construction of S/S is regular civil works for small buildings. The electrical installations consist of the transformers, breakers, capacitors etc. and other protection/controlling devices to ensure required power flow.

The land use along the RoW (27 m for 132 kV) of TLs comprises of agricultural land, private plantation and government land. The total length of the project TLs is 26.401 km and total number of 102 towers are being/to be erected for all proposed 2 TLs and 1 interconnection. The length of TLs earlier in IEAR was 22.5 km. However, as a result, though the length is increased upto small extent, the environmental and social footprints have been reduced as envisaged in IEAR by avoiding the environmental sensitive areas like habitation, PA and Forest area.

The total 5 DLs are studies in this FEAR II. All have been aligned mostly along the existing roads by avoiding dense forest areas. Here, the RoW of corridor being narrower (15m for 33 kV) which further reduced the necessity of tree felling. Much of the line would only need lopping of branches for unhindered passage. The land use along the RoW of lines comprises of agricultural land, private plantation and government land. The original length of the DLs has been increased to 37 km from earlier 30 km in IEAR due to further optimization during ground truthing survey. The exercise is carried out to avoid the forest / PA / WLS / Habitation. This has resulted into reduced environmental footprints on land use and other base line data as compered from earlier identified impacts in IEAR/EMP. A total of around 1228 poles are being/to be erected for all 5 proposed DLs.

According to legal status, the project districts is blessed with 3087 ha forests having various types of flora and fauna. The final layout of TLs and DLs has been carefully selected from three given options. Final routes of TLs and DLs and sites for construction of new S/S don't involve any monuments of historical or cultural significance. The proposed final TLs, DLs and S/S are not passing through any PA like National Parks (NP), Wildlife Sanctuaries (WLS), designated wildlife/elephant passage and biosphere reserves etc., as all such areas have been completely avoided through meticulous route selection. In spite of taking due care during route selection, involvement of some forest area could not be avoided completely. Thus, provisions of the Forest (Conservation) Act (FCA), 1980 are applicable. The proposed TL Kailasahar-Dharmanagar 132 kV D/C line is having 14.3586 Ha of RF area and Stage-I & Stage I (final) approval obtained on 10.04.18 & 07.06.19 respectively. The proposed DL 132/33 kV Ambassa

(Existing) - 33/11kV Jawahar Nagar (New) 33 kV line is having 0.99728 RF area and Stage-I clearance issued on 02.03.2021. Working permission obtained on 10.05.2021. The proposed DL 33 kV Jawaharnagar - Dhumachera is having 21.33 Ha of RF and Stage-I issued on 28.06.2021. Working permission obtained on 29.09.21. This DL was not considered in FEAR study as no survey was completed on site till the submission of FEAR II. However, the site survey is conducted and the feature study are provided in Addendum I. The status shows that no work is being started.

The area of land required for S/S is ranges from 0.74 to 2.18 Acres. In the instant case land required for S/S are already in possession with Tripura State Electricity Corporation Limited (TSECL) and hence no fresh land is needed to be acquired. Since no involuntary acquisition is involved, issue related to acquisition of land including possible R&R is not envisaged. The infrastructure facilitates required for the construction and maintenance of S/S like access road, water, transport facility is well available. Hence no new infrastructure demand is envisaged. The present project requires very less vehicular movement and that too restricted to construction period only. During site survey it is observed that project execution is not resulted into large traffic volume in the area.

During the site selection and detailed survey for TLs, DLs, it has been ensured that these are kept away from oil/gas pipelines and other sites with potential for creating explosions or fires. The equipment installed on TLs/DLs and S/S are static in nature and do not generate any fumes or waste materials. Apart from this, state of art safety instruments, fire safety equipment and firefighting design have been included in the design in the S/S on both the ends, so that, the line gets tripped within milliseconds in case of any fault. The lines proposed under this scheme don't involve any tower/ pole to be placed in river bed which could interfere with existing drainage patterns.

All the TLs and DLs are planned at suitable elevation to avoid any chances of impacts due to flood like situation. All the S/S subproject areas are located at such places where least chances of flooding are observed. However, adequate measures are taken into consideration from design stage to implement the flood, erosion protection measures like construction of retaining wall, boundary wall along with sewerage system. The S/S are designed and being constructed at suitable elevation from the ground / flood levels and proper storm water drainage system is being implemented. In S/S, all drainage channels along or inside S/S are being trained and connected to main or existing drainage to avoid any erosion due to uncontrolled flow of water. This helps to dispose of the storm water collected in the S/S premises, further creating recharge or percolation pits which helps to recharge the ground water table. Almost all S/S are provided with recharge pits. All these mandatory requirements with detailed specifications with respect to equipment design and S/S drainage and sewage design has been included in tender document to avoid any incidence of land and water contamination.

While construction, utmost care was taken to prevent tree felling, mostly, trees were trimmed to carry out work as far as possible. However, in unavoidable situation, in case of trees cutting in forest area, compensatory afforestation on two times the area of degraded forest land is being undertaken by State Forest department subsequently the stipulated conditions recommended in Forest clearances obtained under FCA 1980 and is in implementation process. Tree cutting in non-forest areas are executed strictly under the provisions Electricity Act, 2003/ Indian Telegraph Act, 1885. TSECL pays compensation to affected land owners towards damages and/or utilization of their land for tower footing if any during implementation of transmission project as well as during operation and maintenance phase under this act. For the

true value assessment of timber yielding trees, due concern of forest officials is taken and for fruit bearing trees help of Horticulture department is taken. As per existing law, land for tower/pole & ROW is not acquired and ownership of land remains with the owner and agricultural activities are allowed to continue after construction is over.

During visit to site, it has been observed that excavated pits and all accident-prone areas are appropriately barricaded for safety. All safety measures are in place to avoid fire / explosion hazards. Excavated material from S/S sites are well stored on site and reutilized for levelling and backfilling following C&D Rules 2016 of GoI. Construction management practice has helped in to reduce the soil erosion. No surplus excavated material dumping from S/S site to outside premises is envisaged. Tower footings, pole footings involve very small-scale excavation which is reutilized for backfilling. Impact envisaged during the construction is limited to the boundaries of proposed S/S only. Construction and operation of S/S may raise Ground Noise levels. However, measures like providing sound and vibration dampers and rectification of equipment are undertaken. Environmental quality for Noise and Water is being regularly monitored at S/S locations by construction contractor. Noise levels are observed well below the maximum allowable limit which is 90db for 8 hours in the working area. Also, the water quality is observed to be suitable for drinking purpose.

Necessary care is taken by the contractor for workers health and safety and issues relating to operational health and safety have also been adequately addressed. The labours are provided with PPE kits, safety gear and provisions for first-aid and arrangement for shifting of affected persons to nearby hospitals are also in place. Compensation for injury and death has been ensured through provisions in Safety Plan & Contract condition. Proper sanitation facilities and safe drinking water are being provided in the project locations. The site managers have been advised to ensure that there are no instances of open defecation.

The monitoring committee i.e., IA of this project is very vigilant. It has been observed that concerns of public are addressed/informed regularly about project through public consultation process which started from project planning, continued in the construction period and will be continued in operation and maintenance also. As per record available, no written complaint or court case is registered against any of the sub projects. It has been observed from surveys, public meetings and discussion with PAP, that they are appreciating the efforts taken by both the government and funding agencies to improve power network of that area. Local people believe that this project will enhance their quality of life as well as this project will help them to get new income source in near future.

Overall, the planning and layout of the project elements have been undertaken in a judicious manner so as to ensure minimum environmental impact. During the implementation phase, especially during construction phase, IA is regularly monitoring the implementation of EMP and OHS compliance with reference to the IEAR. The Capacity building and Institutional Strengthening program of the IA is held intermittently to enhance the skills of the project officials. Further, meetings between IA and TSECL are held on a regular basis to assess the work progress and difficulties encountered in respect of land / tree / crop compensation if any.

Our observations from site inspections, where the construction work is started, are concluded that the EMP is being implemented on-site at major. Regular monitoring of work progress is being carried out. The FEAR provides insight on possible environmental & social issues and also describes management measures to minimize/mitigate it based on TSECL's ESPPF. The present report describes the environmental issues/effects that have been encountered or may arise due to setting up this project in the state of Tripura and various mitigation measures are being taken care of by POWERGRID during construction and maintenance stages. However regular monitoring and compliance report are recommended to compare the EMP implementation progress periodically and shortcomings if any. This can be a part of the monthly progress report.

1. PROJECT DESCRIPTION

1.1 Project Background

India's North East Region (NER) stretches across the eastern foothills of the Himalayan Mountain range and is comprised of seven states including Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura. NER in India is endowed with rich energy resources but faces significant bottlenecks in electricity access and availability levels. The per capita power consumption in NER is one-third of the national average. No significant generation capacity has been added between 2004 and 2011 as a result of which inadequate power supply remains a critical constraint to sustainable and inclusive growth, and to scaling up private investment and economic competitiveness in the NER.

The power-starved NER, comprising Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura, is blessed with a huge hydro potential. The region also has abundant resource of coal, oil and gas for thermal power generation. According to the estimates of the North Eastern Electric Power Corporation (NEEPCO), the NER has the potential of about 58971 MW hydro power i.e. almost 40% of the country's total hydro potential; but out of this only less than 2% (1095MW) has so far been harnessed. As per the report status of hydroelectric power potential listed by Central Electricity Authority (CEA) out of the total capacity of 58971MW, only 4029 MW has been tapped, which amounts to less than 7%. The region has a reserve of 151.68 billion cubic feet natural gas, which is capable of generating 7500 MW for 10 years. The region is also blessed with 864.78 million tons of coal against 186 billion tons of reserves in the country. With this reserve in the NE Region, approximately 240 MW/day can be generated for a period of 100 years.

But, in spite of such huge potential, the region ranks lowest in the country in terms of power generation and per capita energy consumption mainly due to lack of proper planning, inhospitable climatic conditions, remote location and inaccessibility. However, with continual improvement of infrastructure and communication facilities, the NE stands to become the power house of India by utilizing its surplus power potential, especially in hydel sector. The region offers a large potential in renewable energy, which is also yet to be exploited. There is also an imbalance between hydel and thermal power, both in terms of generation and availability. The T&D sector are the weakest link of the electricity industry in the NE region. Huge T&D losses, estimated to be at over 40 %, lower tariffs as compared to costs of generation and transmission and mounting losses of the state electricity boards, are crippling the electricity sector of the region.

The road-map for development of power sector specifying the need for strengthening of overall Transmission, Sub-transmission system of NER and Sikkim was brought out in the "Pasighat Proclamation on Power" released during the first Sectoral Summit of North Eastern Council (NEC) at Pasighat in Arunachal Pradesh in January 2007. Pursuant to recommendations of Pasighat summit, a Sub-Group was constituted under the Chairmanship of Member (Power System), CEA on Transmission, Sub-transmission related issues in NER.

Recognizing that intrastate T&D systems in the NER states have remained very weak and that there is a critical need to improve the performance of these networks, the CEA developed a comprehensive scheme in December 2007 for the NER in consultation with POWERGRID and the concerned state governments. This scheme is intended to (a) augment the existing T&D infrastructure to improve the reliability of service delivery across all the NER states and (b)

build institutional capacity of the power utilities and departments in the NER. This scheme is part of the Government of India's (GoI) wider efforts to develop energy resources in the NER for electricity supply within the region, to strengthen transmission networks, expand and strengthen sub-transmission systems, and extend last mile electricity connectivity to household.

GoI with the financial assistance of the World Bank (WB) has planned a composite scheme viz. NERPSIP to create/augment proper infrastructure/network of T&D in the region. The scheme covers six North Eastern States (Assam, Meghalaya, Manipur, Tripura, Nagaland & Mizoram) to create a robust power network by improving the intra-state T&D (33kV and above) network with required capacity building initiatives for effective utilization of assets. In 2016, the WB has approved a loan (IBRD 470 USD Million) to the GoI for NERPSIP on 50:50 (WB loan: GoI) basis except the component of capacity building for Rs. 89 crore, which GoI will bear entirely. The scheme is to be taken up under a new Central Sector Plan Scheme of Ministry of Power (MoP).

MoP, GoI has appointed POWERGRID as Implementing Agency (IA) to six NER States for the said project under Tranche-1 in close coordination with the respective State Governments / Utilities. However, the ownership of the assets shall be with the respective State Utilities / State Government which upon progressive commissioning shall be handed over to them for taking care of Operation and Maintenance (O&M) of assets. POWERGRID is also facilitating in building the institutional capacity of the state departments and utilities to continue managing the rehabilitated networks in an efficient manner. The state wise scope of works proposed under Tranche-1 is given below in **Table 1-1**.

Table 1-1: State Wise Scope of Work Proposed Under Tranche-1

State	Transmission/ Sub-station (132kV & above)			Distribution (33kV)		
	Line (km)	New S/s (No.)	Total MVA (New & Aug.)	Line (km)	New S/s (No.)	Total MVA (New & Aug.)
Assam	233	11	1644	479	16	240
Manipur	254	2	160	131	13	229.4
Meghalaya	225	4	940	263	11	135
Mizoram	143	3	125	5	1	6.3
Nagaland	193	5	245	60	10	200
Tripura	261	9	1306.5	1096	34	450.5
Total	1309	34	4420.5	2034	85	1261.2

The project has two components namely Component A: Priority Investments for Strengthening Intrastate Transmission, Sub-transmission, and Distribution Systems, and Component B: Technical Assistance for Capacity Building and Institutional Strengthening (CBIS) of Power Utilities and Departments of Participating States. The total project cost is **Rs. 5111.33 Crore** with financing from both GoI and Bank on 50:50 basis. The Bank is providing financial support to the tune of US\$ 470 million (**Rs. 2511.165 Crore**) under the Loan No.-8631-IN which was signed on 28th November, 2016 and became effective from 20th February, 2017. The loan closing date is 31st March, 2023. The remaining financing including capacity building will be met through Govt. of India funding. Details of State wise funding is placed below in **Table 1.2**.

Table 1-2: State Wise Funding from World Bank Under Tranche-1

State	World Bank	Government of India		Total (Rs. in Cr.)
	Project Cost (Rs. in Cr.)	Project Cost (Rs. in Cr.)	Capacity Building (Rs. in Cr.)	
Assam	729.485	729.485	14.83	1473.803
Manipur	213.690	213.690	14.83	442.213
Meghalaya	381.050	381.050	14.83	776.933
Mizoram	150.965	150.965	14.83	316.763
Nagaland	357.290	357.290	14.83	729.413
Tripura	678.685	678.685	14.83	1372.203
Total	2511.165	2511.165	89.00	5111.33

1.2 Project Justification

The State of Tripura is spread over an area of about 10,492¹ km² with a population of more than 37 Lakhs. The State of Tripura is endowed with rich energy resources but faces significant bottlenecks in electricity access and availability levels. The present per capita energy consumption is of the order of 335 units (kWh) against the regional per capita consumption of about 258 units and national per capita consumption of about 779 units. The State meets its power requirement through about 164.5 MW of self-generation and about 105 MW of power allocation from various central sector generation projects of NHPC and NEEPCO. The present average peak demand is of the order of 250 MW. As most of the generation projects in the north eastern region are hydro in nature, the State faces shortage of power during low-hydro generation condition.

Summary of subprojects to be implemented in the State in Tranche-1 under NERPSIP along with capacity addition is described below.

Presently, the State draws its share of power from central sector generating stations through following inter-state transmission system (ISTS):

- Agartala GPP – Agartala (Tripura) 132kV D/C
- Agartala GPP – Kumarghat(POWERGRID) 132 S/C
- Kumarghat (POWERGRID) – Aizwal (POWERGRID) 132kV S/C
- Kumarghat (POWERGRID) – Badarpur (POWERGRID) 132kV S/C
- Dharamanagar(Tripura) – Dullavcherra(Assam) 132kV S/C
- Pallatana (OTPC) – Silchar (POWERGRID) 400kV D/C
- Pallatana (OTPC) – Surjamaninagar (Tripura) 400kV D/C (initially operated at 132kV)

As per the 18th Electric Power Survey of CEA, the future demand of the State is expected to grow to about 340 MW by year 2016-17 and 472 MW by year 2021-22. This shall be met through various hydro and thermal projects coming up in the north-eastern region in near future, which are as follows:

- Pallatana GBPP : 726 MW
- Bongaigaon TPS : 750 MW
- Kameng HEP : 600 MW
- Lower Subansiri HEP : 2000 MW

The State has a share of about 316 MW from these future generation schemes. With this, the total share of the State from central sector generating stations shall be about 421 MW.

¹ tripura.gov.in

Following lines have been planned to transfer power from these future generation schemes to the state of Tripura:

- Surjamaninagar (Tripura) - Purba Kanchanbari (Tripura) 400kV D/C (to be initially operated at 132kV)
- Purba Kanchanbari (Tripura) – Silchar (POWERGRID) 400kV D/C (to be initially operated at 132kV)

The present intra-state transmission system of the State is quite old & weak and is unable to cater to the growing power requirements of the State. Although the present T&D system covers many areas of the State, it is inadequate in its reach and appropriate T&D system. Breakdown of any transmission system element results in long term power shortages making the system highly unreliable. Besides, some of the network elements have undergone long term outage due to break-down. Therefore, it has become essential to address the above situation through remedial measures in the T&D system. Accordingly, phase-wise strengthening of T&D system has been proposed.

The transmission schemes proposed under this report are priority schemes under Tranche-1 and are essential for improving the power supply situation in the State. Implementation of these schemes promised to improve quality, reliability, security and enhancement of the power supply in the State.

1.3 Benefit of the Project

The proposed T&D schemes not only improve overall power supply situation but also improve reliability, quality, security and enhancement of power supply in the State.

1.4 Project Highlights

Table 1-3: Details of project

Sr. No.	Particulars	Details
1	Project Name	NERPSIP – Tranche- I, Tripura
2	Location	Different parts of Tripura State
3	Beneficiary States	Tripura
4	Project Cost	Rs.1372 Cr.
5	Commissioning Schedule	2019

1.5 Project Scope and Present Study

In line with Environment and Social Policy & Procedures Framework (ESPPF) of TSECL, POWERGRID carried out comprehensive environment and social assessment of each subproject and prepared Initial Environmental Assessment Report (IEAR). These reports were subsequently disclosed for public information both on the State Utility, POWERGRID and WB website after obtaining approval on the reports from the WB.

As mandated in the ESPPF, a Final Environment Assessment Report (FEAR) for each subproject need to be prepared with an objective to assess the compliance of mitigation measures identified in IEAR including implementation of EMP provisions by IA/ Contractor. However, as per Project Agreement signed between POWERGRID and Bank such study is required to be undertaken by Independent Agencies as per Term of Reference agreed with Bank. As a part of this development, POWERGRID appointed GREEN CIRCLE, INC as independent consultant vide

LOA Ref No.: NEGW/C&M/NERPSIP/18-19/700-14/LOA-51/468 dated 31st December 2018 to carry out FEAR study.

1.5.1 Project Scope Components

FEAR is undertaken to verify the actual location details of the project elements like 132/33 kV Tls, 33/11 kV DLs and associated S/S in Dhalai, North Tripura & Unakoti Districts of Tripura State covered under NERPSIP. The scope covered is identification and examination of deviation of environmental and social issues as addressed in IEAR, reporting of effects on the biodiversity of the region / protected area (PA), identification of the project affected people (PAP) and assessment of onsite compliance of the IEAR / Environment Management Plan (EMP) prepared and submitted by the IA. The study is carried out adhering to ESPPF of TSECL, Operation Policies of WB designated for Electric Power T&D projects. Refer **Table No. 1.4** for the project scope components.

Table 1-4: Project Scope Components

Sr. No.	Name of the Line	Name of the New / Existing Substation
A. TRANSMISSION SCHEME		
1	Kailasahar- Dharmanagar 132 kV D/C line – 21.916 Km	Extension of 132/33 kV at Kailasahar Extension of 132/33 KV S/S at Dharmanagar
2	LILO of 132kV Ambassa - PK Bari line at Manu S/S – 1.175 Km	Establishment of 2 x 50 MVA, 132/33 kV new S/S at Manu Augmentation of 132/33 KV S/S at Ambassa.
3	132 KV Interconnection from old Manu S/S to New Manu S/s at Chauwmanu for charging at 132 KV S/C Manu to Chawmanu – 3.310km	-
B. DISTRIBUTION SCHEME		
1	132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line – 5.186 km	Establishment of 2x5 MVA, 33/11 kV new S/S at Jawahar Nagar
2	*33/11 kV Jawahar Nagar (New) - 33/11 kV Dhumachhera (new) 33 kV line - 23 Km	-
3	132/33 kV Manu (New) - 33/11 kV Dhumachhera (New) 33kV line – 6.628 Km	Establishment of 2x5 MVA, 33/11 kV new S/S at Dhumachhera
4	132/33 kV Manu (New) - 33/11kV 82 Mile (new) 33 kV line – 15.193 Km	Establishment of 2x5 MVA, 33/11 kV new S/S at 82 Mile
5	132/33 kV P K Bari (Existing) -33/11 kV 82 Mile (New) 33 kV line – 8.094 Km	-
6	**132/33 kV Kailasahar (Existing) - 33/11kV Tilla Bazar (New) 33 kV line – 8.2 Km	Establishment of 2x5 MVA, 33/11 kV new S/S at Tilla Bazar
7	**33/11kV Durgachowmohni (new) - LILO of Salema- Kamalpur 33 kV line- 4.5 Km	Establishment of 2x5 MVA, 33/11 kV new S/S at Durgachowmohni
8	33/11kV Chailengta (New) – LILO point of Chamanu-Manu Line- 1.829 Km	Establishment of 33/11 KV S/S at Chailengta

**:Presented in Addendum I as per suggestion of WB because the line details are received in November 2021.*

*** : Not included in FEAR as survey is yet to be completed and hence no data is available*

The project activities include the survey for finalizing the route alignment and installation of Tls and construction of S/S (civil and electrical installation). Lattice towers/ poles are then erected on designated places using normal excavation and foundations thereafter conductors are strung across these using manual/stringing machines. The construction of S/S is regular civil works for small buildings. The electrical installations consist of the transformers, breakers, capacitors etc. and other protection/controlling devices to ensure required power flow.

A power map showing the transmission grid of Tripura highlighting the above lines and other new projects placed as **Figure 1-1 and Annexure 1**. Schematic map showing the various projects covered under the subject FEAR is placed in **Figure 1-2 and Annexure 2**.

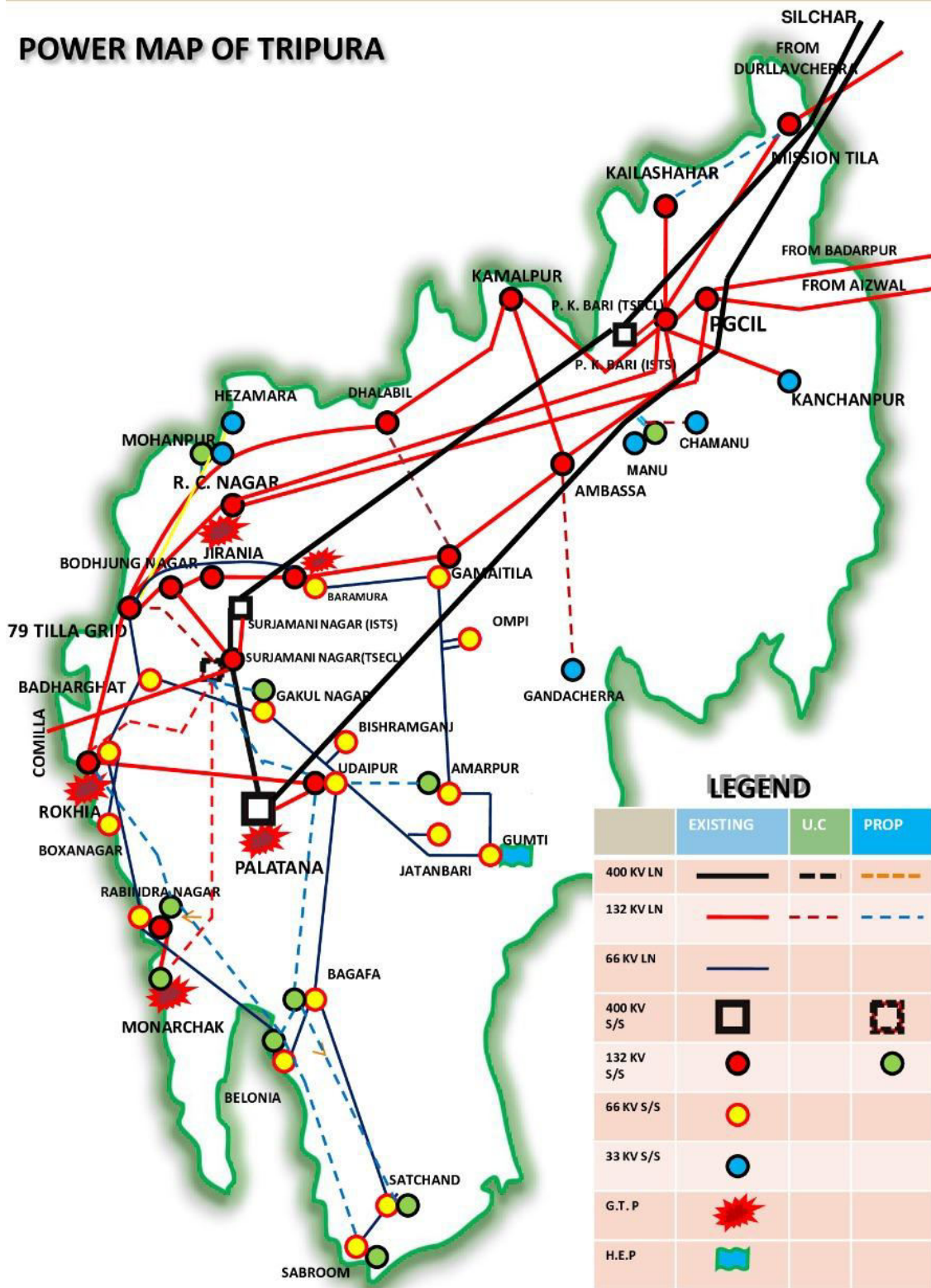


Figure 1-1: Power Map of Tripura

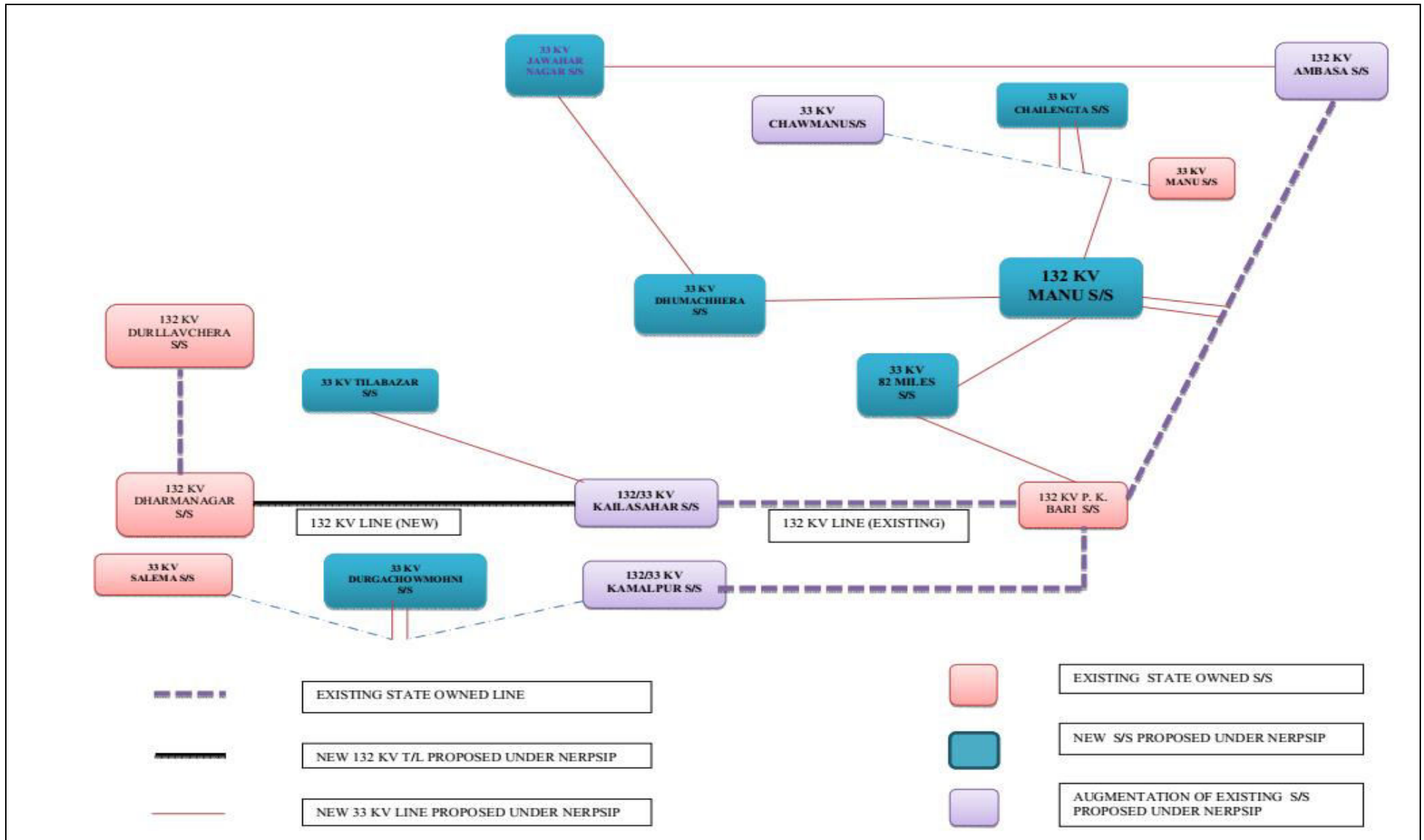


Figure 1-2: Schematic Map Showing Proposed T&D Network in Dhalai, Unakoti & North Tripura Districts under NERPSIP

1.6 Overall Project Progress

A brief status on project implementation progress of various T&D components till May 2021 is presented below;

Table 1-5: Status of the Project as on Date

Sr. No.	Name of the T&D Component	Progress as on May, 2021
A. TRANSMISSION SCHEME: AGENCY - EMC / TEEMS		
1	Kailasahar- Dharmanagar 132 kV D/C line	TL length: 21.916 Kms. <ul style="list-style-type: none"> • Forest proposal status: Stage II approval is obtained as on 07th June 2019. • Total number of Tower foundation: 81 amongst which 33 are completed. • Tower Erection: 18 are completed • Stringing of Conductor, Stringing of OPGW: Yet to Commence • Expected Completion Date: December 2021
2	LILO of 132kV Ambassa - PK Bari line at Manu S/S	TL Length: 1.175 kms Line completed in November 2020
3	132 KV Interconnection from old Manu S/S to New Manu S/s at Chauwmanu for charging at 132 KV S/C Manu to Chawmanu	TL Length: 3.310 kms Line completed in March 2021
B. DISTRIBUTION SCHEME: AGENCY - M/S TECHNOFAB ENGINEERING LTD		
1	132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line	DL Length: 5.186 km <ul style="list-style-type: none"> • Forest Proposal Status: Stage 1 approval is obtained on 02nd March 2021 with working permission on 10th May 2021 • Total number of Pole foundation and Erection: 192 Total Poles. No work is started yet. • Stringing of Conductor, Stringing of OPGW: Yet to Commence • Expected Completion Date: December 2021
2	132/33 kV Manu (New) - 33/11 kV Dhumachhera (New) 33kV line	DL Length: 6.628 Km Line completed in April 2021
3	132/33 kV Manu (New) - 33/11kV 82 Mile (new) 33 kV line	DL length: 15.192 Kms. <ul style="list-style-type: none"> • Total number of Pole foundation and Erection: 430 Total Poles. 17 poles are erected. • Stringing of Conductor, Stringing of OPGW: Yet to Commence • Expected Completion Date: December 2021
4	132/33 kV P K Bari (Existing) -33/11 kV 82 Mile (New) 33 kV line	DL length: 8.094 Kms. <ul style="list-style-type: none"> • Total number of Pole foundation and Erection: 285 Total Poles. 83 poles are erected. • Stringing of Conductor, Stringing of OPGW: Yet to Commence • Expected Completion Date: December 2021
5	33/11kV Challengta (New) – LILO point of Chamanu-Manu Line	DL length: 1.829 Kms. Line completed in January 2021
C. SUBSTATIONS:		
1	Extension of 132/33 kV at Kailashahar (2 x 50 MVA 132/33kV Transformer + 2x10 MVA 33/11kV Transformer	AGENCY – M/s SPML <ul style="list-style-type: none"> • CRB construction is under progress. 20% completed. • Transformer foundation work for 6 nos. Yet to start • Transformer erection: Not started yet • Equipment foundation: 57 of total 99 number is completed. • Total 199 Equipment erection: Not started yet • Tower / LM foundation: Total 11 numbers is completed amongst 18.

Sr. No.	Name of the T&D Component	Progress as on May, 2021
		<ul style="list-style-type: none"> • Tower 44 Structure Erection: Not started yet • Cable trench of total 220 RM: Not started yet • Testing and commissioning: Not started yet. • Expected Completion of work on site: December 2021
2	Extension of 132/33 KV S/S at Dharma Nagar	
	AGENCY – M/s SPML	<ul style="list-style-type: none"> • CRB construction is under progress. 33% completed. • Equipment foundation: 44 of total 44 number is completed. • Total 67 Equipment erection: Not started yet • Tower / LM foundation: Total 9 numbers is completed amongst 9. • Tower 9 Structure Erection: Not started yet • Cable trench of total 80 RM: Not started yet • Testing and commissioning: Not started yet. • Expected Completion of work on site: December 2021
3	Establishment of 2 x 50 MVA, 132/33 kV new S/S at Manu	
	AGENCY – M/s SPML	<ul style="list-style-type: none"> • Site levelling works completed 60% • 110 RM boundary wall amongst 500 RM is completed. 33% of Retaining wall construction is completed • CRB construction is under progress. 27% completed. • Transformer foundation work for 6 nos.: 1 no. (50 MVA) is in progress • Transformer erection: Not started yet • Equipment foundation: 80 out of 106 number is completed. • Total 191 Equipment erection: Not started yet • Tower / LM foundation: Total 19 numbers is completed amongst 28. • Tower Structure Erection (34): Not started yet • 153 RM road construction WIP and Drain Construction of 310 mt is yet to start. • Cable trench of total 190 RM: Not started yet • Testing and commissioning: Not started yet. • Expected Completion of work on site: December 2021
4	Augmentation of 132/33 KV S/S at Ambassa.	
	AGENCY – M/s SPML	S/S completed in February 2021
5	Establishment of 2x5 MVA, 33/11 kV new S/S at Jawahar Nagar	
	AGENCY – M/S TECHNOFAB ENGINEERING LTD	<ul style="list-style-type: none"> • Site levelling works completed 3% • 235 RM boundary wall amongst 240 RM is completed. • CRB construction is under progress. 12% completed. • Transformer foundation work for 2 nos.: Completed • Transformer erection (9): Not started yet • Equipment foundation (17): WIP. • Total 25 Equipment erection: Not started yet • Tower / LM foundation: Total 9 numbers is completed amongst 9. • Tower Structure Erection (9): Not started yet • 100 RM road construction and Drain Construction of 172 mt is yet to start. • Cable trench of total 190 RM: Not started yet • Testing and commissioning: Not started yet. • Expected Completion of work on site: December 2021
6	Establishment of 2x5 MVA, 33/11 kV new S/S at Dhumachhera	
	AGENCY – M/S TECHNOFAB ENGINEERING LTD	Soil inv. Completed. Work not started yet. Expected Completion of work on site: December 2021
7	Establishment of 2x5 MVA, 33/11 kV new S/S at 82 Mile	
	AGENCY – M/S TECHNOFAB ENGINEERING LTD	<ul style="list-style-type: none"> • Site levelling works completed 25% • 178 RM boundary wall amongst 201 RM is completed. • CRB construction is under progress. 2% completed.

Sr. No.	Name of the T&D Component	Progress as on May, 2021
		<ul style="list-style-type: none"> Transformer foundation work for 2 nos.: Completed Transformer erection (2): Not yet started Equipment foundation (17): Completed Total 25 Equipment erection: Not started yet Tower / LM foundation: Total 9 numbers is completed amongst 9. Tower Structure Erection (9): Not started yet 100 RM road construction and Drain Construction of 172 mt is yet to start. Cable trench of total 128 RM: Not started yet Testing and commissioning: Not started yet. Expected Completion of work on site: December 2021
8	Establishment of 2x5 MVA, 33/11 kV new S/S at Tilla Bazar	
	AGENCY – M/S TECHNOFAB ENGINEERING LTD	Soil inv. Completed. Work not started yet. Expected Completion of work on site: December 2021
9	Establishment of 2x5 MVA, 33/11 kV new S/S at Durgachowmohni	
	AGENCY – M/S TECHNOFAB ENGINEERING LTD	<ul style="list-style-type: none"> Site levelling works completed 20% 198.7 RM boundary wall amongst 198.7 RM is completed. CRB construction is under progress. 44% completed. Transformer foundation work for 2 nos.: Completed Transformer erection (2): Not yet started Equipment foundation (17): Not yet started Total 25 Equipment erection: Not started yet Tower / LM foundation (9): WIP Tower Structure Erection (9): Not started yet 100 RM road construction and Drain Construction of 172 mt is yet to start. Cable trench of total 128 RM: Not started yet Testing and commissioning: Not started yet. Expected Completion of work on site: December 2021
10	Establishment of (2 x 5 MVA Transformer) 33/11 KV S/S at Chailengta	
	AGENCY – M/S TECHNOFAB ENGINEERING LTD	<ul style="list-style-type: none"> Site levelling works completed 1% 60 RM boundary wall amongst 240 RM is completed. CRB construction is under progress. 52% completed. Transformer foundation work for 2 nos.: Not started yet Transformer erection (2): Not yet started Equipment foundation (17): Not yet started Total 25 Equipment erection: Not started yet Tower / LM foundation (9): Not started yet Tower Structure Erection (9): Not started yet 100 RM road construction and Drain Construction of 172 mt is yet to start. Cable trench of total 128 RM: Not started yet Testing and commissioning: Not started yet. Expected Completion of work on site: December 2021

1.7 Objective and methodology adopted for FEAR study

The main objectives of the FEAR study are to assess the mitigative measures as suggested in IEAR and/or EMP are effectively implemented/ addressed at the ground during pre-construction & construction stages of project cycles. The study also helps in establishing the status of compliance of various mitigation/management measures provided in the IEAR/EMP and suggests gaps or weaknesses, if any.

To achieve this, GCI undertook a comprehensive biophysical, environmental, socioeconomic data gathering exercise along the TL/ DL routes and S/S location to assess / verify the actual site-specific measures implemented / being implemented by IA/ Contractor in respect of measure/ actions listed in IEAR/EMP. The project methodology flow chart is given below:

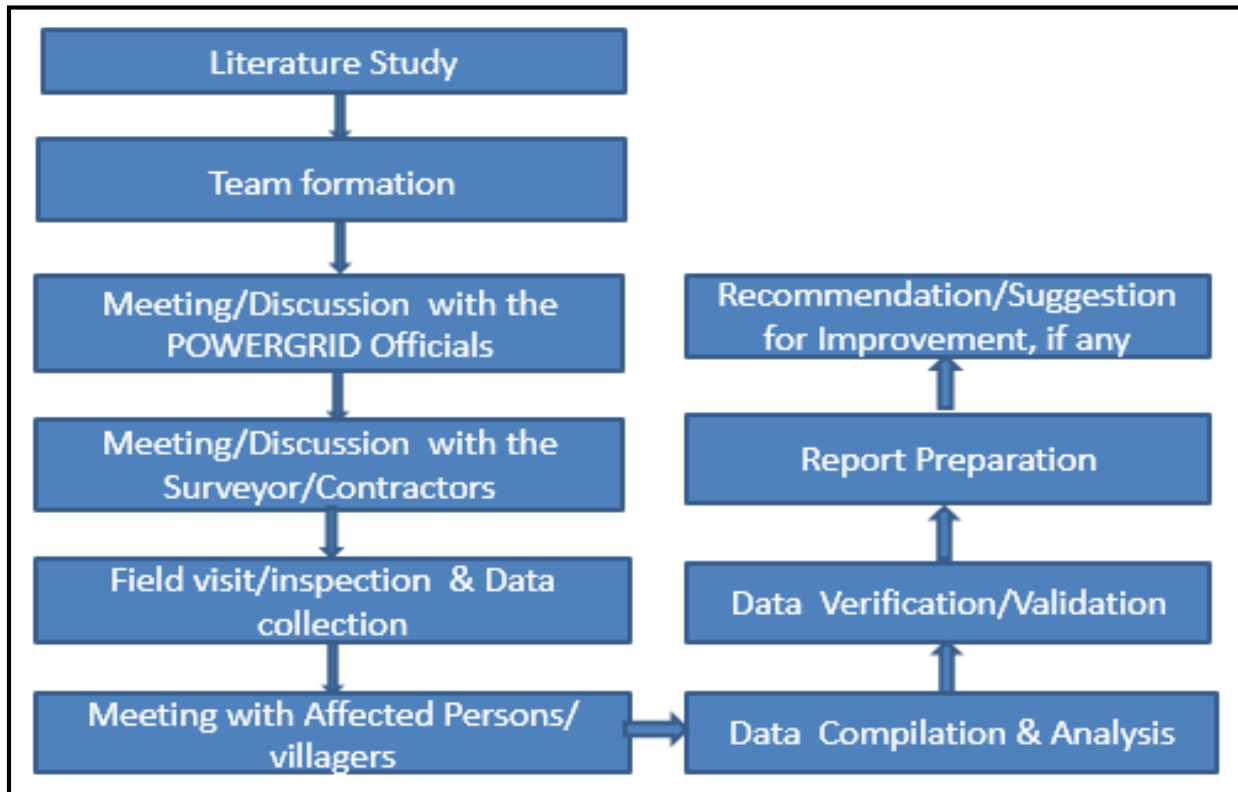


Figure 1-3: Study Methodology for Preparation of FEAR

The methodology for the proposed study is inclusive of but not limited to following steps:

1. **Review of existing reports:** Review of existing reports and data prepared and generated by POWERGRID such as IEAR, ESPPF, Compensatory Plan for Temporary Damage (CPTD) etc. was undertaken and suitably incorporated in the present report.
2. **Literature review / Analysis of Secondary Data:** Review of existing literature are undertaken for collection of secondary baseline data related to physiography, climatic conditions, demography, natural resources including forest/wildlife and socio-economic features of the study area. Sources and data so collected have been mentioned below:
 - Literature from various research papers was reviewed for study biodiversity of the project site
 - A Revised Survey of the Forest Types of India' by Champion and Seth (1968) was used for forest type classification of forests in the study area.
 - Data collected from published literature of Zoological Survey of India (ZSI), Forest Survey of India (FSI), Botanical Survey of India (BSI) and other research and government publications for floral and faunal diversity of the study area.
 - Soil map of the study area was prepared using 'Soils of Tripura for Optimizing Land Use, NBSS Publ.67b, 2000' published by National Bureau of Soil Survey & Land Use Planning (NBSS & LUP), Nagpur.
 - Conservation status of flora and fauna of the study area as per Indian Wildlife (Protection) Act (1972), threatened status according to IUCN Red List 2020.1, Red Data Book of Indian Plants by Botanical Survey of India, Kolkata.
 - Census of India 2011 for demography of the study area.

3. **Collection & collation of primary data:** The data was collected by extensive field visits and interaction with various stakeholders such as POWERGRID, Contractor, forest officials, Project Affected People (PAPs) and public at large. The environmental primary data other than vegetation profile is verified and ascertained through the discussion with local people and stakeholders, Site visits and IEAR carried out for the proposed T&D alignment and S/S and final alignment schedule. In order to, collect data with respect to final route alignment with important feature & maps, forest involvement/forest clearances, other applicable statutory clearances/consent/ exact number of trees to be filled / are damaged both in forest as well as non-forest area, number and profile of PAP along with details of compensation provided to PAPs. This includes collection of any other primary data, which, in the opinion of agency, is required for ascertaining the compliance of the mitigating measures as enlisted in IEAR/EMP. Besides, photographs of important events such as interaction with various stakeholders, safe working practices, borrow area management, top soil management and construction during lean period etc. was taken as evidence.
4. **Collection of primary data and Physical verification of construction elements:** To gather primary data/ physical verification, a field visit/ survey of the project area along with IA and Contractor staff was made from February 2019 to May 2021. The data which has been collected from field visit are implementation status of proposed environmental management plan and mitigation measures as suggested in IEAR. Also, the environmental monitoring for ambient Noise levels and water quality is regularly carried out at S/S locations as part of EMP monitoring by construction Contractors. **Environmental baseline reports at various subproject sites are presented at Appendix-A.**

Ground truthing/physical verification was made with photographic evidence and verification of record maintained by IA and Contracts for various activities for monitoring the compliance of mitigation measures like Health and Safety measures, Solid waste and sanitation, construction of protection wall/ retaining walls, status of labour camps location of proposed S/S, towers, and T&D Lines alignments. Findings of field survey were consolidated along with secondary data for interpretation and finding the gaps for immediate necessary action.

5. **Ascertaining the compliance:** Analysis and interpretation of secondary and primary data to ascertain the compliance of the measures as discussed in EMP.
6. **Survey of flora and fauna:** Phyto-sociological survey is necessary as this is a TL project. Being a TL project, Phyto- sociological surveys for assessment of vegetation structure/ profile in the proximity of the proposed TLs, corridors of TL routes, S/S, etc. were conducted wherein line transect methodology has been followed. Faunal surveys were also conducted along the same transects. As the topography along the routes varied from undulating / plain to top of hill hills. It was therefore, not feasible to chart the entire routes of proposed TL as large part of the routes has steep slopes and due to issues of accessibility at present. However, during the field surveys it was tried to survey minimum 10% of the route for flora data collection, which in some cases constituted a continuous stretch and, in some cases, could be covered in parts. The stretches were selected considering diversity of flora. At some places along the alignment, forest plantation is recorded e.g., rubber plantation which is homogenous. At some stretches the diversified flora is recorded. As regard substation, the whole substation area was covered. The details are reported in chapter 2 section 2.4.4. The fauna elements were not found during field surveys in the project areas except some bird and common fauna. Hence the data was collected through consultations with local public, Forest department officials and POWERGRID officials working in the project area.

The results of the primary field surveys were supplemented with secondary data to fill the gaps and further with the information generated through PRA. In addition, at all the sites bird walks

were also undertaken, particularly areas under private plantations nearby the routes to locate nesting sites and for bird sightings.

7. **Consultation:** During assessment consultation was done with stakeholders like various field officers of consulting team such as Central Project Implementation Unit (CPIU)/ State Project Coordination Unit (SPCU) POWERGRID officials, Contractor, migratory labors, local labors, Gram Burrah (village head) and public representatives to collect data with respect to compliance of suggested Environmental Management Plan and implementation of mitigation measures. **The details of exercise are presented at Appendix-B.**
8. **Development of Maps:** Geo-referenced and Google maps with superimposed coordinates of project elements were generated to verify locational details and details of physical features of terrain of the project locations (**Please refer to the Annexure A and B**).

1.8 FEAR Structure

Chapter I: Project Description:

Brief description of the background, objective of the project, resultant benefit and scope of the work.

Chapter 2: Baseline Data:

Description of the relevant physical, physiographical, and socioeconomic condition of the project area including description of natural resources base like forest resources or any other environment sensitive areas like National Park sanctuary etc. along with description of climatic condition, population and other demographic features of the project area.

Chapter 3: Policy, Legal and Regulatory Framework:

Description of the policy, Legal and Regulatory framework applicable to transmission project and the environmental requirement under which environment assessment has been carried out.

Chapter 4: Major Features of Final Route & Environment Impact:

Brief description of the environmental criteria for selection of route and major features of final route alignment, details of forest involvement including number of trees and species of the trees likely to be affected. The details of forest clearance and environmental impact matrix describing in brief the extent of impact of TL.

Chapter 5: Potential Environmental Impact, Evaluation and its Management:

Description of the measures adopted and under implementation for identified impact due to project location, design, construction, O&M details of public consultation and its documentation, details of contractual conditions regarding safeguard issues under scope of contract for compliance and conclusion listing the category of the project based on the impact and analysis.

Chapter 6: Monitoring and Organization Support Structure:

Description of the monitoring plan, reporting pattern/frequency, external monitoring requirement/timing for potential environment & social issues with compliance status of Environment Management Plan (EMP) and organization support structure.

2. BASELINE DATA

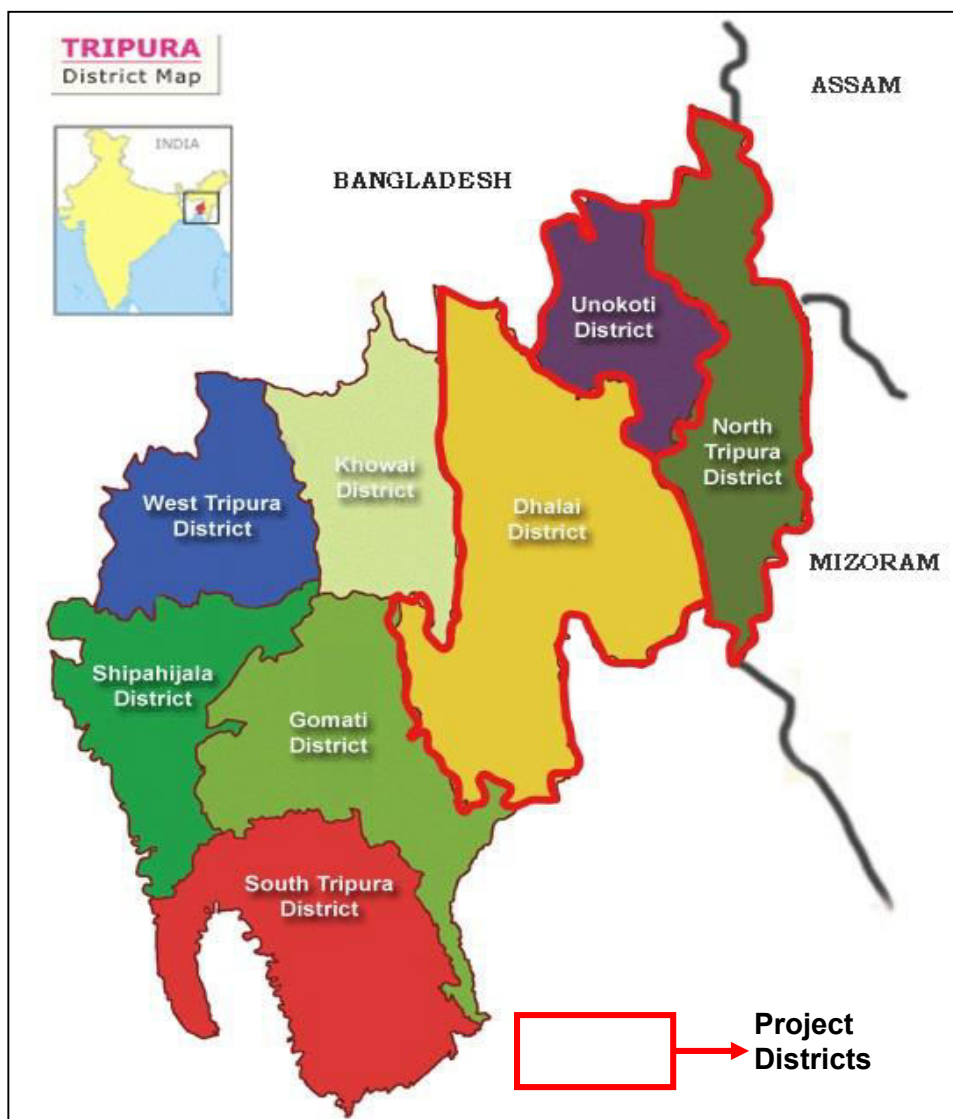
2.1 Introduction

Impact Assessment defines and assesses the potential physical, biological, and socio-economic impacts of a project and helps in formulating management and mitigation measures to minimize the impacts to a great extent. This chapter deals with the baseline status of physical, biological, socio-economic environment in the project districts as well as study area.

2.2 Project Location

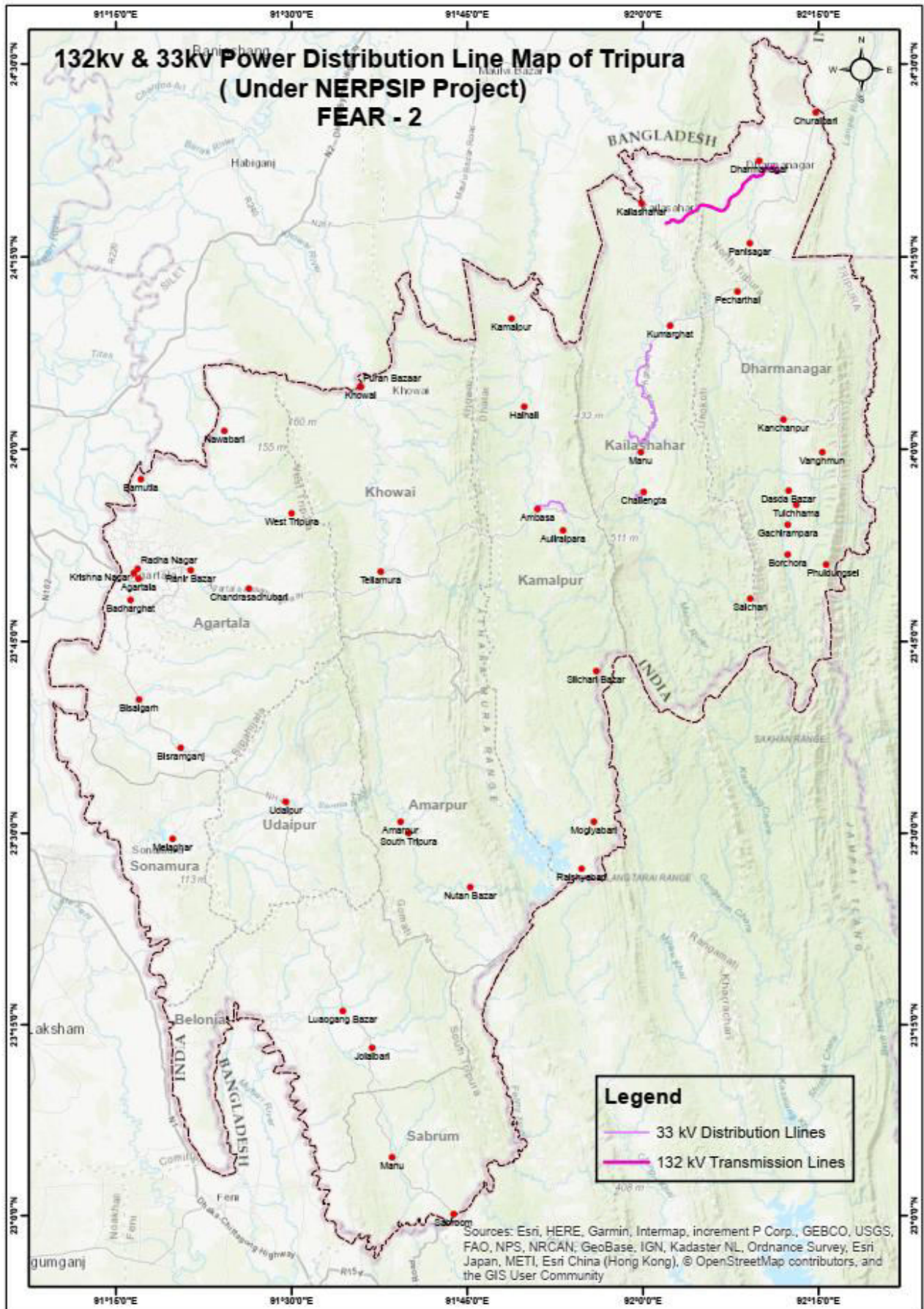
The project is an intra-state power sector project located in the State of Tripura and covers the districts of Dhalai, North Tripura & Unakoti (part of undivided North Tripura district). **Please refer Map 2-1.** The map showing location of various subprojects is presented in **Map - 2.2 & Map - 2.3.**

Map 2-1: Location Map of the Project²

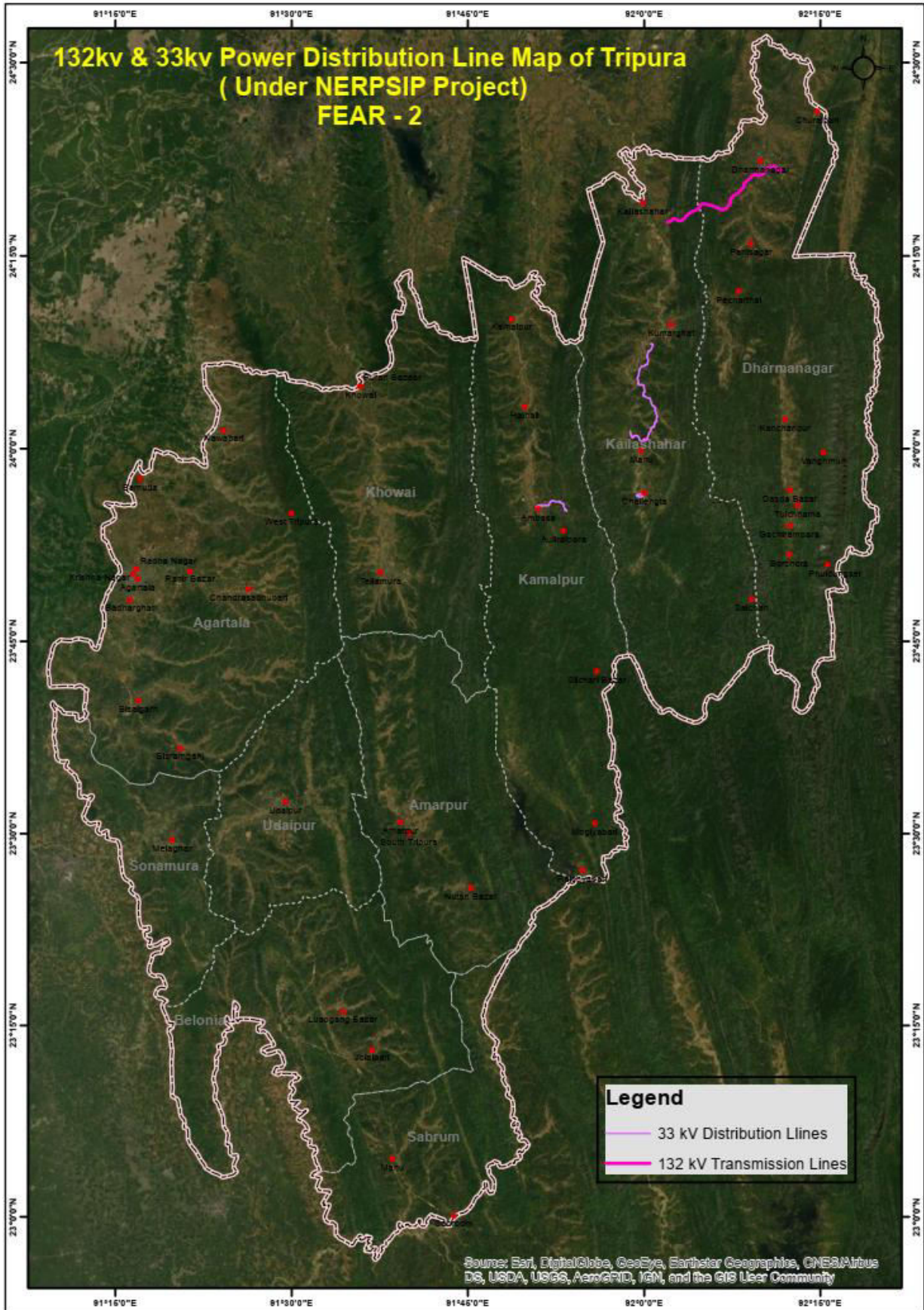


² Tripura Space Application Centre, Vigyan Bhawan, Tripura
Green Circle Inc.

Map 2-2: Topo Map Showing Subprojects Locations



Map 2-3: Google Map Showing Subprojects Locations



2.2.1 Tripura State³

Tripura state is situated in the north eastern part of the country and shares international border with Bangladesh from three sides. The area of the State is 10,491 Sq. Km which forms 0.32% of country's geographical area. The State lies between latitude 22°57' N and 24°33' N and longitude 91°10' and 92°20' E in North Eastern Region physiographic zone. Tripura is a land locked state and its geographical limits touch both national and international boundaries. Its length of international boundary line with Bangladesh measures 839 km. Its national boundaries with Assam and Mizoram measure 53 km and 109 km respectively. The basic environmental settings of the State and subject project area are discussed in the upcoming sections.

2.2.2 Study Area Districts⁴

2.2.2.1 Dhalai District

Dhalai district is situated at 23°56'N latitude and 91°51'E longitude. Total geographical area of the district is 2400 sq.km. It is bounded by Bangladesh in both North and South, by Khowai, Gomati and South Tripura districts in the west and by North Tripura & Unakoti districts in the east. The district headquarters is at Ambasa.

2.2.2.2 North Tripura District

North Tripura district lies between 24°36'N latitude and 92°19'E longitude. Total Geographical area of the district is 1422.19 Sq. Km. It is bounded by Bangladesh in North, by Assam in the west, by Unakoti & Dhalai districts in the East and by Mizoram & Bangladesh in the south. The Headquarter of the district is located at Dharma Nagar.

2.2.2.3 Unakoti Tripura District

Unakoti district of Tripura is located between 24°05' N to 24°23'25" N latitude and between 91°55' E to 92°12' E longitude. Kailashahar is its headquarters. The district is bordered by Dhalai district of Tripura on the western to southern side, by North Tripura on the southern to eastern to north-eastern side and by Bangladesh on the north. Unakoti district was created on 21.01.2012 from the bifurcation of North Tripura district. Total Geographical area of the district is 686.97 Sq. km.

2.3 Physical Environment

2.3.1 Climatic Conditions – Tripura State:

The State has a tropical savanna type climate, designated under the Kappen climate classification. The undulating topography leads to local variations, particularly in the hill ranges. The four main seasons are winter from December to February, pre-monsoon or summer from March to April, monsoon from May to September and post-monsoon from October to November. During the monsoon season the south west monsoon brings heavy rains,

³ <http://trpervis.nic.in/>

⁴ District Survey Report, 2018, GoT

which cause frequent floods. The climate conditions of projects districts are described in the sections below;

2.3.2 Climatic Conditions – Project Districts:

2.3.2.1 Dhalai District:

Climate of the district is characterized by tropical monsoon type. The temperature between the hills and plains, which ranges between sub-tropical in the plains to temperate climatic conditions found in the hilly areas. The topographic features seem to have influenced the climatic condition of the Dhalai district, where the plains are hotter and humid in comparison to the hills, which have a salubrious climate. The four main seasons here are- (i) Winter season (December to February), (ii) Pre-monsoon season (March to May), (iii) Monsoon season (June to September), and (iv) Post Monsoon season (October to November) (Bhatt and Bhargava, 2006). The average maximum annual temperature is 35⁰C and minimum annual temperature is 10.50⁰C. Average annual rainfall is very high (2150 mm) in the study area. The climatic condition of the district as a whole is suitable for rubber plantation.

2.3.2.2 North Tripura District:

The North Tripura district in particular has a tropical monsoon type of climate. The temperature between the hills and plains, which ranges between sub-tropical in the plains to temperate climatic conditions found in the hilly areas. The topographic features seem to have influenced the climatic condition of the North Tripura district, where the plains are hotter and humid in comparison to the hills, which have a salubrious climate. The four main seasons here are- (i) Winter season (December to February), (ii) Premonsoon season (March to May), (iii) Monsoon season (June to September), and (iv) Post Monsoon season (October to November) (Bhatt and Bhargava, 2006). The hilly regions enjoy higher temperature in summer and lower temperature in winter in comparison with the plain lands. The climatic temperature generally ranges in between 10⁰C and 35⁰C. Average annual rainfall is 1500 mm.

2.3.2.3 Unakoti District:

The Unakoti district in particular has a tropical monsoon type of climate. The temperature between the hills and plains, which ranges between sub-tropical in the plains to temperate climatic conditions found in the hilly areas. The topographic features seem to have influenced the climatic condition of the North Tripura district, where the plains are hotter and humid in comparison to the hills, which have a salubrious climate. The four main seasons here are- (i) Winter season (December to February), (ii) Premonsoon season (March to May), (iii) Monsoon season (June to September), and (iv) Post Monsoon season (October to November) (Bhatt and Bhargava, 2006). The hilly regions enjoy higher temperature in summer and lower temperature in winter in comparison with the plain lands. The climatic temperature generally ranges in between 10⁰C and 35⁰C. Average annual rainfall is 1500 mm.

2.3.3 Topography – Tripura State^{5,6}:

The State has three distinct physiographic zones i) hill ranges ii) undulating plateau land and iii) low-lying alluvial land. Five major hill ranges traverse the State in roughly north-south direction and continue southward into Chittagong Hill Tract. Narrow valleys separate these ranges generally 20 km wide. The easternmost range is Jampui, being successively followed to the West by Unokoti-Sakhantlang, Longthorai, Atharamura-Kalajhari and Baramura-Deotamura. The highest peak lies at Bethliangchhip (Thaidawar, Shib-rangkhung), 975.36 m above the sea level.

Sedimentary rocks which range in age from Miocene to loosely consolidated sediments of recent age represent the geology of the state. The rocks are sandstone, siltstone and shale grading into clay. These rock types are repeated as layers, one above the other. Depending on their character and the presence of fossils, these sedimentary rock sequences are divided into Surma group, Tipam group and the Dupitila group. From the nature of the grains and the texture imprinted on these rocks, it is inferred that originally the sediments were deposited in the sea and later converted into rocks. The recent fluvial deposits occupy quite a large part of south Tripura district. The sedimentary rocks are deformed and folded.

2.3.4 Topography – Project Districts:

2.3.4.1 Dhalai District:

The topography of Dhalai district is mostly rocky and undulating & hilly terrain with small water streams (chheras), rivers and fertile valleys intervening. Maximum hilly areas in the state are situated under Dhalai district. About 75 % of the district geographical areas are characterized by hilly terrain covered with dense forests and only about 25 % are plains. Three hills range i.e., Atharamura, Longtarai and Sakhan ranges are found to be seen here. Longtharai hill is the highest peak of the district. The elevation of these hill ranges is higher in the south and decrease towards the north; however, the height of these ranges gains as one move from west to the east direction (Saigal, 1978). These hill ranges are characterized with narrow ridges, knife edged and steep slopes. River Dhalai and Manu River are the main water course of the district. Beside that there are cherras viz., Jarulchhara, Kanchanchhara etc. Physiographically, the district can be divided into two divisions- (1) The hill ranges, and (2) The valley / plain areas. As per Agroclimatic zones the district is in Mild Tropical Plain Zone. The major soil recorded as per agroclimatic zones are Inceptisols, Ultisols, Entisol⁷.

2.3.4.2 North Tripura District:

The topography of North Tripura district is mostly rocky and undulating surface with small water streams (chharas), rivers and fertile valleys intervening. About 70 % of the district geographical areas are characterized by hilly terrain covered with dense forests and only about 25 % are plains. One hill range i.e., Jampui hill range is found here. The average altitude of the hill range is approximately 900 m above sea level. The main water courses of North Tripura District are Deo & Juri river. Physiographically, the district can be divided into two divisions- (1) The hill ranges, and (2) The valley / plain areas. Jampui hills is located along the eastern

⁵ ENVIS Tripura Report

⁶ GoT, District Survey Report, 2018

⁷ State Level Perspective Plan for Watershed Development of Tripura

boundary of the district and Dharmanagar-Panisagar valley located at the north western part. As per Agroclimatic zones the district is in Mild Tropical Plain Zone. The major soil recorded as per agroclimatic zones are Inceptisols, Ultisols, Entisol.

2.3.4.3 Unakoti District:

The topography of Unakoti district is mostly of rocky terrain with some undulating surface. About 75 % of the district geographical areas are characterized by hilly terrain covered with dense forests and only about 25 % are plains. The main water courses of Unakoti District are Manu & Deo River. Beside this there are many cherras viz., Kathal, Dem, Danga, Hamuk, Kuki, Longtarai, Baghai, Kanchan, Bet, Rata, Bara Laljuri, Choto Laljuri, Demdum, Bara Sayada, Choto Sayada, Mora, Fatik, Dhanbilash, Bhutia, Nageshwari, Baiphai, Bagna, Barai, Halai, Chhagaldema, Kalai, Lakshmi, Bursi, Nun, Deora, Balu, Samru, Kaphna, Pabni, Suna, Dalu etc. Physiographically, the district can be divided into two divisions- (1) The hill ranges, and (2) The valley / plain areas. Two hills range i.e., Longtharai and Machhlithum/Sakhan range are partly found here. The elevation of these hill ranges is higher in the south and decrease towards the north; however, the height of these ranges gains as one move from west to the east direction. The major soil recorded as per agroclimatic zones are Inceptisols, Ultisols, Entisol.

2.3.5 Landuse Pattern – Tripura State⁸:

For Land use details of Tripura State and Project Districts, Land use statistics of Ministry of Agriculture, GOI, 2018-2019 and North Eastern Development Finance Corporation Ltd (NEDFI), 2018 are referred. Majority of the Tripura State area is 60% is covered by forest land followed by 24% agricultural land. The general land use area of the Tripura State is given in **Table 2.1**, Land Use Distribution in **Figure 2.1**. The LULC Map created by NRSA, 2014 is referred from NBSS LUP publication, 2019 is depicted in **Map 2.4**.

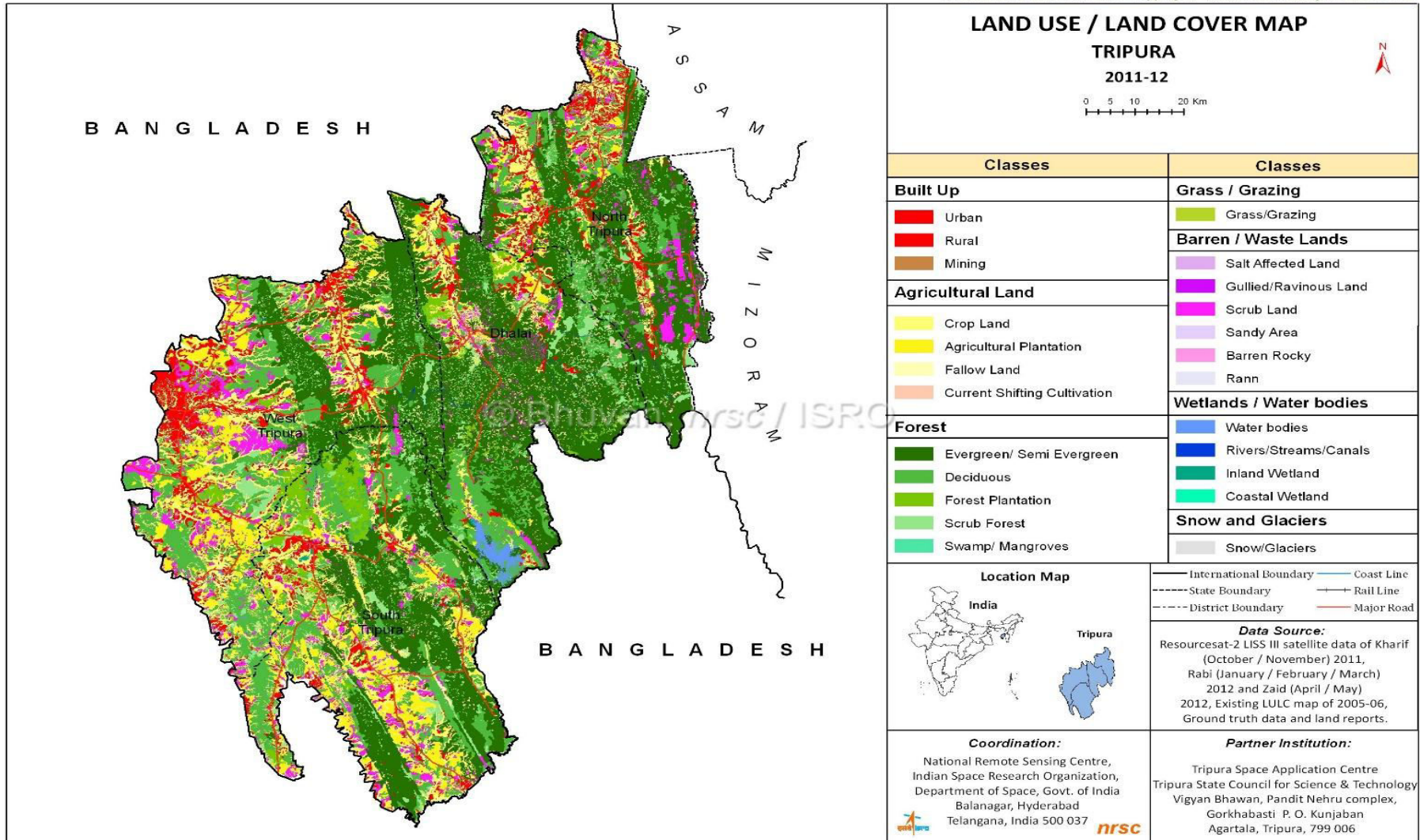
Table 2-1: Land use pattern of State Tripura

Sr. No.	Land Use Classes	Area in Ha	%
1	Geographical area	1049169	100
2	Forest Area	629426	60
3	Land Not Available for Agricultural Use	148304	14.1
4	Land under Misc. tree Crops & groves not including in net Area sown	10125	-
5	Permanent pasture & other grazing land	944	-
6	Culturable Waste land	2578	-
7	Total (6+7+8)	13647	1.3
8	Fallow Land	Current Fallow	1055
9		Fallow Land Other than Current fallow	1189
10	Total (10+11)	2244	0.2
11	Net Cropped area	255548	24.4
12	Gross cropped Area	487000	-
13	Area sown more than once	231452	-
14	Cropping Intensity (%)	191	-
15	Cultivable land	271439	-

⁸ Source: Land use statistics, Ministry of Agriculture, GOI, 2018-2019 and NEDFI, Land Use Details, 2018

Map 2-4: Land use Map of State Tripura

National Land Use / Land Cover Mapping on 1:50,000 scale using IRS LISS-III data



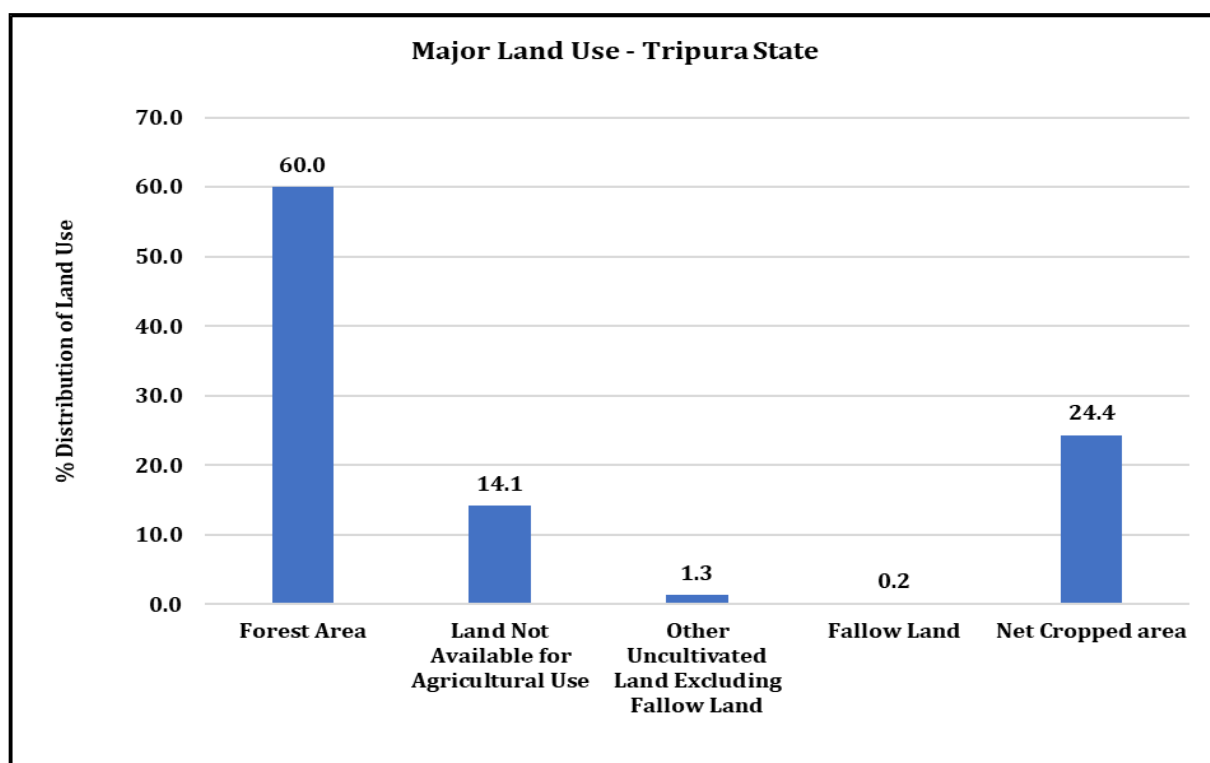


Figure 2-1: Land use pattern of State Tripura

2.3.6 Landuse Pattern – Project Districts⁹:

2.3.6.1 Dhalai District:

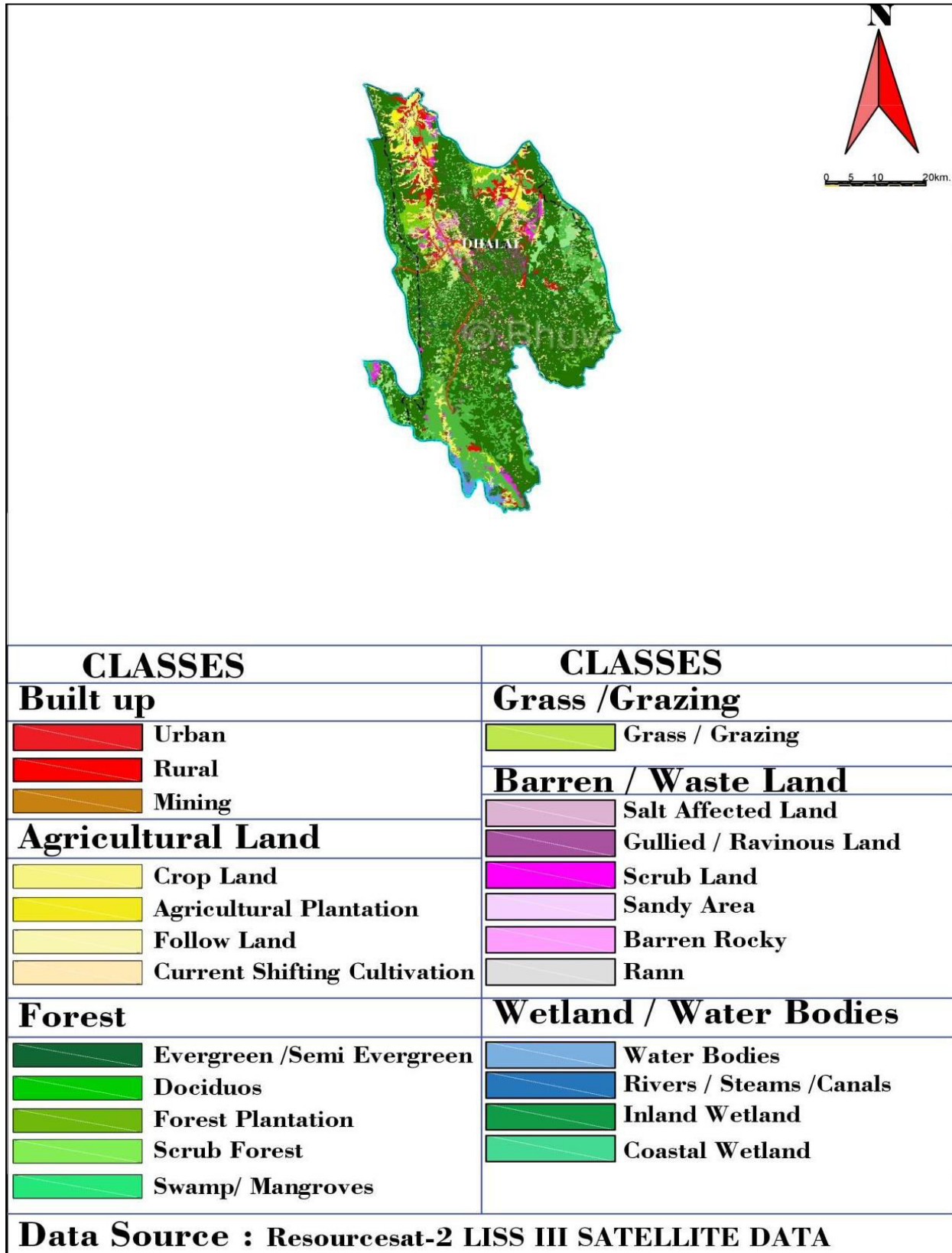
Majority of the Dhalai project district area i.e. 77.48% is covered by Forest area, 13% covered by nonagricultural land and 8.42% is agricultural land area. The general land use pattern of the project district is given in **Table 2.2**.

Table 2-2: Landuse Pattern of Project District – Dhalai

Sr. No.	Land Use Classes	Area in Ha	%
1	Geographical area	240000	100
2	Forest Area	185940	77.48
3	Land Not Available for Agricultural Use	31415	13.09
4	Land under Misc. tree Crops & groves not including in net Area sown	1238	-
5	Permanent pasture & other grazing land	142	-
6	Culturable Waste land	261	-
7	Total (6+7+8)	1641	0.68
8	Fallow Land		
	Current Fallow		-
9	Fallow Land Other than Current fallow		-
10	Total (10+11)	788	0.33
11	Net Cropped area	20216	8.42
12	Gross cropped Area	34531	-
13	Area sown more than once	14315	-

⁹ Land use statistics, Ministry of Agriculture, GOI, 2018-2019 and NEDFI, Land Use Details, 2018

Map 2-5: General Land use Map of Project District - Dhalai¹⁰



¹⁰ District profile of Dhalai, GoT, 2018 - 2019

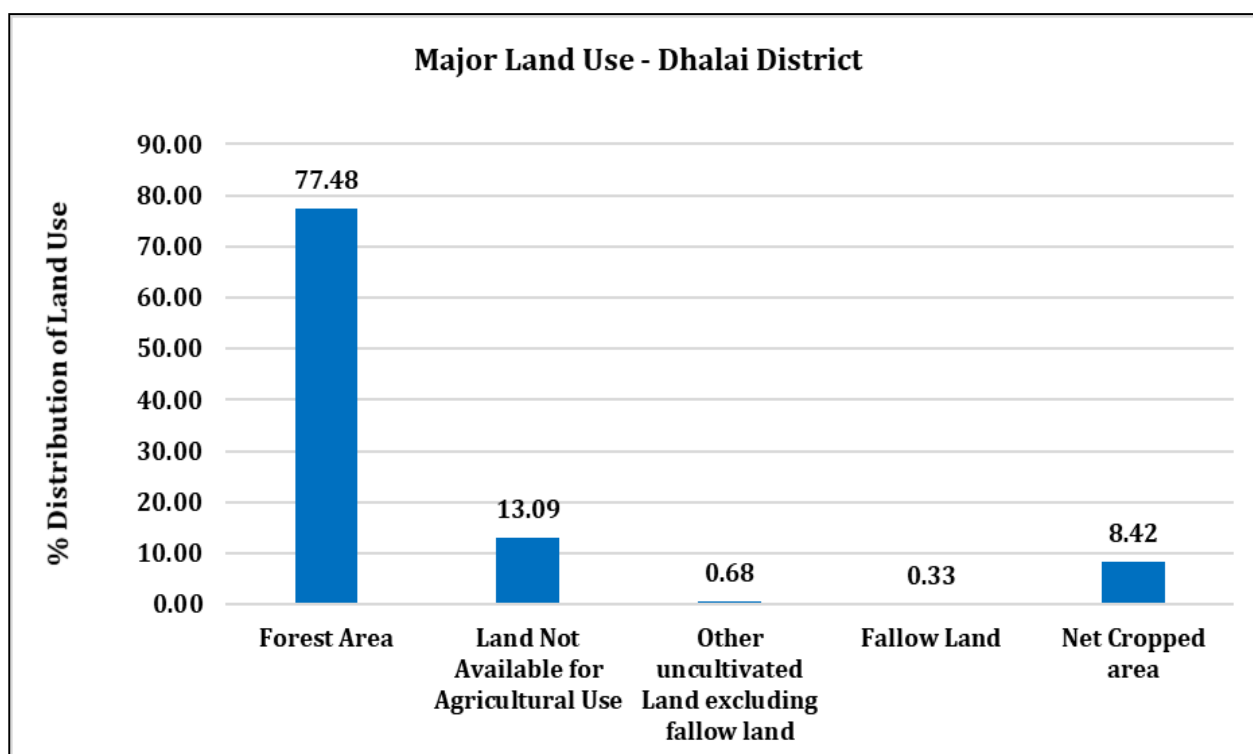


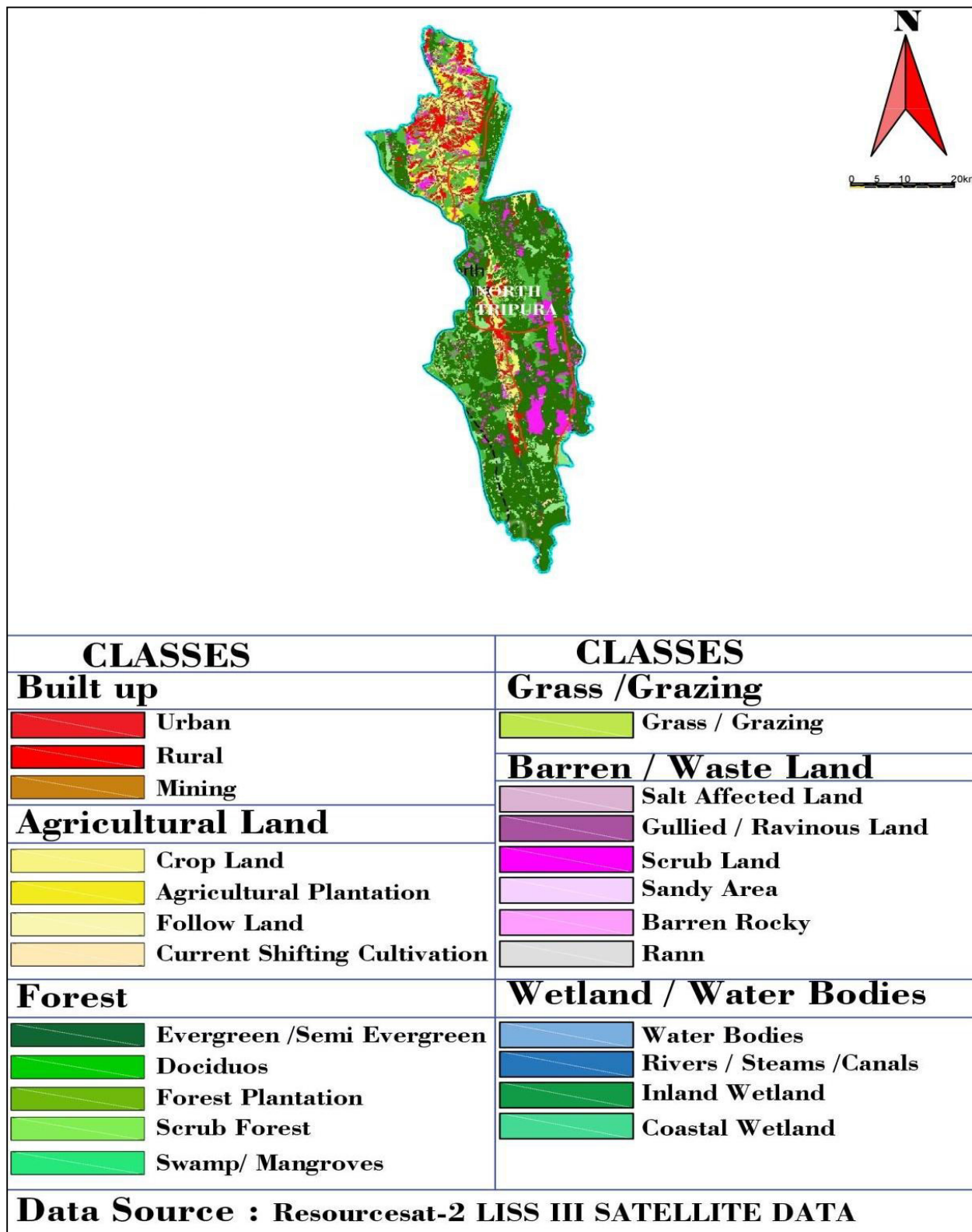
Figure 2-2: Land use pattern of Project District - Dhalai

2.3.6.2 North Tripura District:

Majority of the North Tripura project district area i.e. 63.1% is covered by Forest area, 16.7% covered by nonagricultural land and 15.5% is agricultural land area. The general land use pattern of the project district is given in **Table 2.3**.

Table 2-3: Landuse Pattern of Project District - North Tripura

Sr. No.	Land Use Classes	Area in Ha	%	
1	Geographical area	142219	100	
2	Forest Area	89674	63.1	
3	Land Not Available for Agricultural Use	23725	16.7	
4	Land under Misc. tree Crops & groves not including in net Area sown	4679	-	
5	Permanent pasture & other grazing land	391	-	
6	Culturable Waste land	1180	-	
7	Total (6+7+8)	6250	4.4	
8	Fallow Land	Current Fallow	264	-
9		Fallow Land Other than Current fallow	295	-
10	Total (10+11)	559	0.4	
11	Net Cropped area	22011	15.5	
12	Gross cropped Area	37405	-	
13	Area sown more than once	15394	-	

Map 2-6: General Land use Map of Project District – North Tripura¹¹

¹¹ District profile of North Tripura, GoT, 2018 - 2019

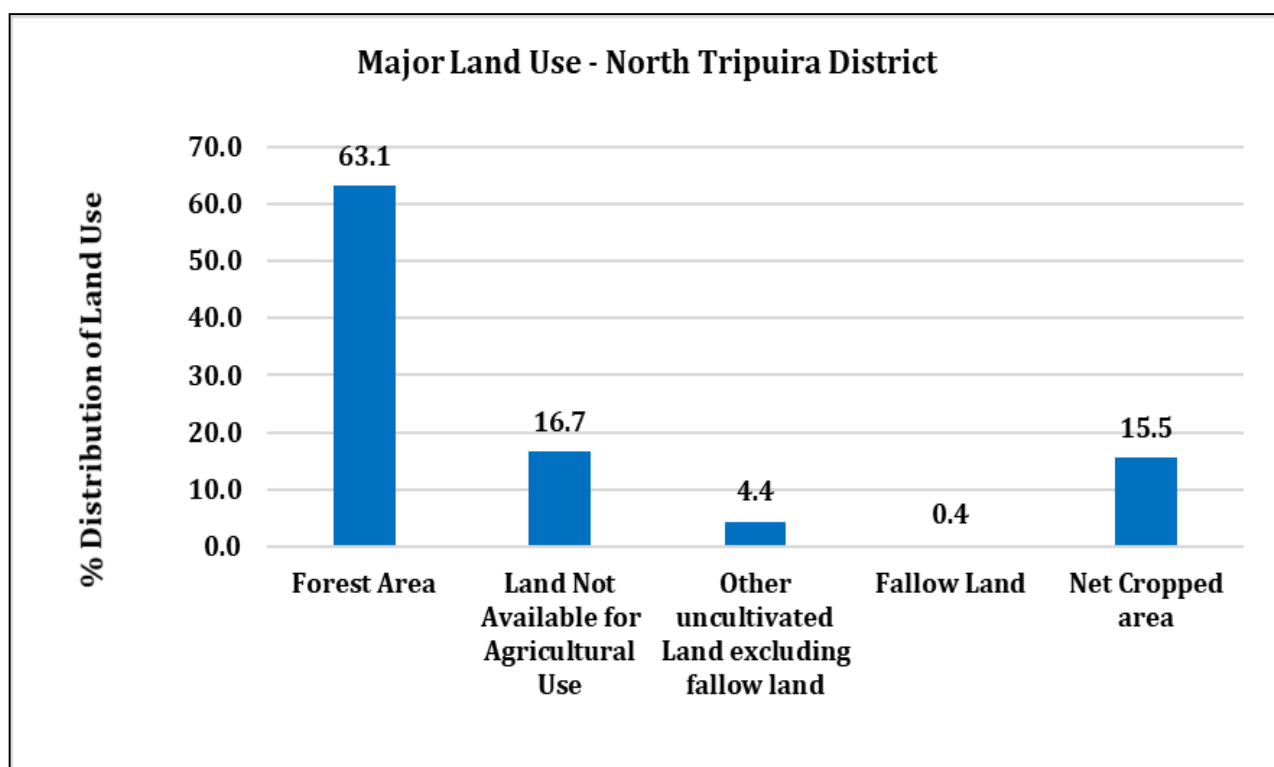


Figure 2-3: Land use pattern of Project District – North Tripura

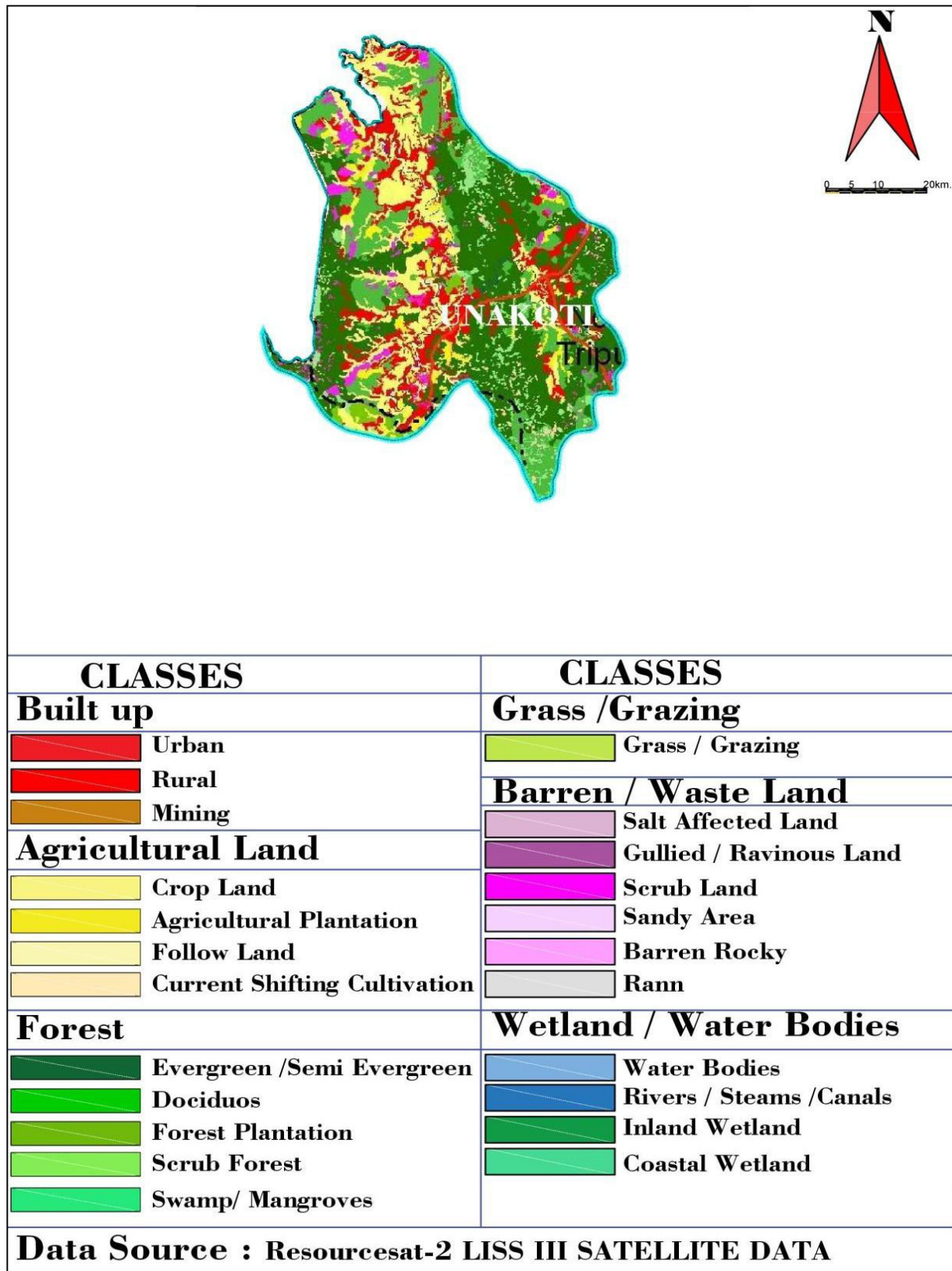
2.3.6.3 Unakoti District:

Majority of the North Tripura project district area i.e. 48.0% is covered by Forest area, 19.9% covered by nonagricultural land and 25.8% is agricultural land area. The general land use pattern of the project district is given in **Table 2.4**.

Table 2-4: Landuse Pattern of Project District – Unakoti

Sr. No.	Land Use Classes	Area in Ha	%
1	Geographical area	68779	100
2	Forest Area	33039	48.0
3	Land Not Available for Agricultural Use	13714	19.9
4	Land under Misc. tree Crops & groves not including in net Area sown	2739	-
5	Permanent pasture & other grazing land	258	-
6	Culturable Waste land	852	-
7	Total (6+7+8)	3849	5.6
8	Fallow Land	190	-
9	Fallow Land Other than Current fallow	258	-
10	Total (10+11)	448	0.7
11	Net Cropped area	17729	25.8
12	Gross cropped Area	32038	-
13	Area sown more than once	14309	-

Map 2-7: General Land use Map of Project District - Unakoti¹²



¹² District profile of North Tripura, GoT, 2018 - 2019

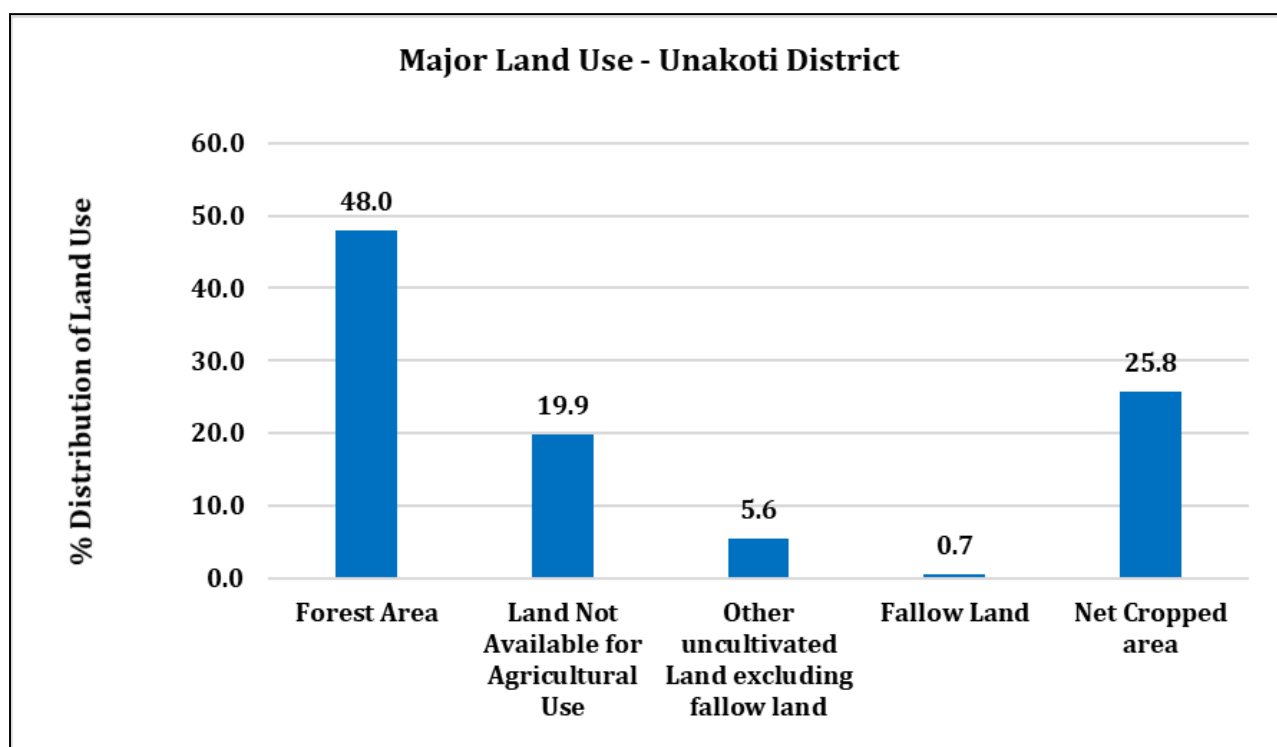


Figure 2-4: Land use pattern of Project District – Unakoti

2.3.7 Major Rivers – Tripura State¹³

The State of Tripura has rich water resources with the presence of as many as ten major rivers, including Gumti, Manu-Deo and Khowai. All rivers are rain-fed and ephemeral in nature. All major rivers originate from hill ranges and show a typical drainage pattern called trellis, except a few instances of dendrite pattern. A study of basin characteristics by CSME (1989) indicate that eight of the ten basins are within the territorial limit of Tripura while basin areas of river Fenni and Langai are shared by two Indian States viz. Tripura and Mizoram and Bangladesh. Collectively basin area of ten major rivers and other minor streams covers nearly 10,500 sq. km. In terms of percentage of the basin of individual rivers vis-a-vis, total basin Gumti (22.66%), is followed by Manu-Deo (18.36%) and Khowai.

Table 2-5: Major Rivers of Tripura State¹⁴

Sr. No.	Name of River	Tributaries	Length in Tripura	Origin and Flow
1.	Longai	It is tributary of Barak River	98 km	Originates at Jampui Hill Northerly flow
2.	Juri	Deo chhera, Kakri chhera, Lal chhera, Bali chhera, Hakai N, Lchailal chhera	79 km	Originates at Jampui Hill, Northerly flow through Dharmangar valley
3.	Deo	It is a tributary of	132 km	Originates at Jampui Hill, Northerly flow through Kanchanpur valley, meets Manu river.

¹³ Water Resource Department (WRS), GoT, 2019

¹⁴ TRIPURA (C-SAP) 2015-2020

Sr. No.	Name of River	Tributaries	Length in Tripura	Origin and Flow
4.	Manu	Manu River Deo R, Chamanu chhera, Chailengtha chhera, Kanan chhera, Lakhmi chhera, Madhal chhera	167 km	Originates at Sakhan range & Northerly flow via Kailasahar to Bangladesh
5.	Dhalai	Bahuri chhera, Chandrai chhera, Sofema chhera, Tamthung chhera, Surma chhera, Kulai chhera, Dalu chhera, Nali chhera	117 km	Originates at Longtharai range, Northerly flow via Kamalpur to Bangladesh
6.	Bijoy / Burinala	Rangpani chhera	54	Originates from Baramura hill range and flows westward through Agartala valley and near Boxanagar it enters Bangladesh
7.	Khowai	Balu chhera, Jeel chhera, Chamal chhera, Ahiadia chhera, Bhaskar chhera, Maharani chhera, Trirupa chhera, Samru chhera, Lal chhera	166 km	Originates in the eastern part of the Atharamura Hills flow to Bangladesh
8.	Haroa	Donaigaon, Ghoramora, Debtang, Champanadi, Debatila chhera	53 km	Originates at Baramura range, Westward flow via Agartala to Bangladesh
9.	Sumli	Tributary of Hawra Rive	50.2 km	Originates from the Damra Hills of Boromura hill range tributary of Choka River
10.	Sonai	Tributary of Barak Rive	145.13 km	Major Southbank tributary of the Barak River originates from Lushai Hills of Mizoram state and falls in the Barak River at Sonaimukh.
11.	Gumti	Sarma chhera, Malik chhera, Maharani chhera, San gang, Ganga chhera	133 km	Originates at Longtharai and Atharamura flows to via Sonamura town Bangladesh

Sr. No.	Name of River	Tributaries	Length in Tripura	Origin and Flow
12.	Muhuri	Tributary of Fenni Rive	64 km	Originates at Deotamura range, Westward flow via Belonia to Bangladesh
13.	Fenni	Muhuri Rive	116 km	Originate at the border by confluence of three streams, of which Asalong is the main channel

Map 2-8: River Map of Tripura State with Project Districts



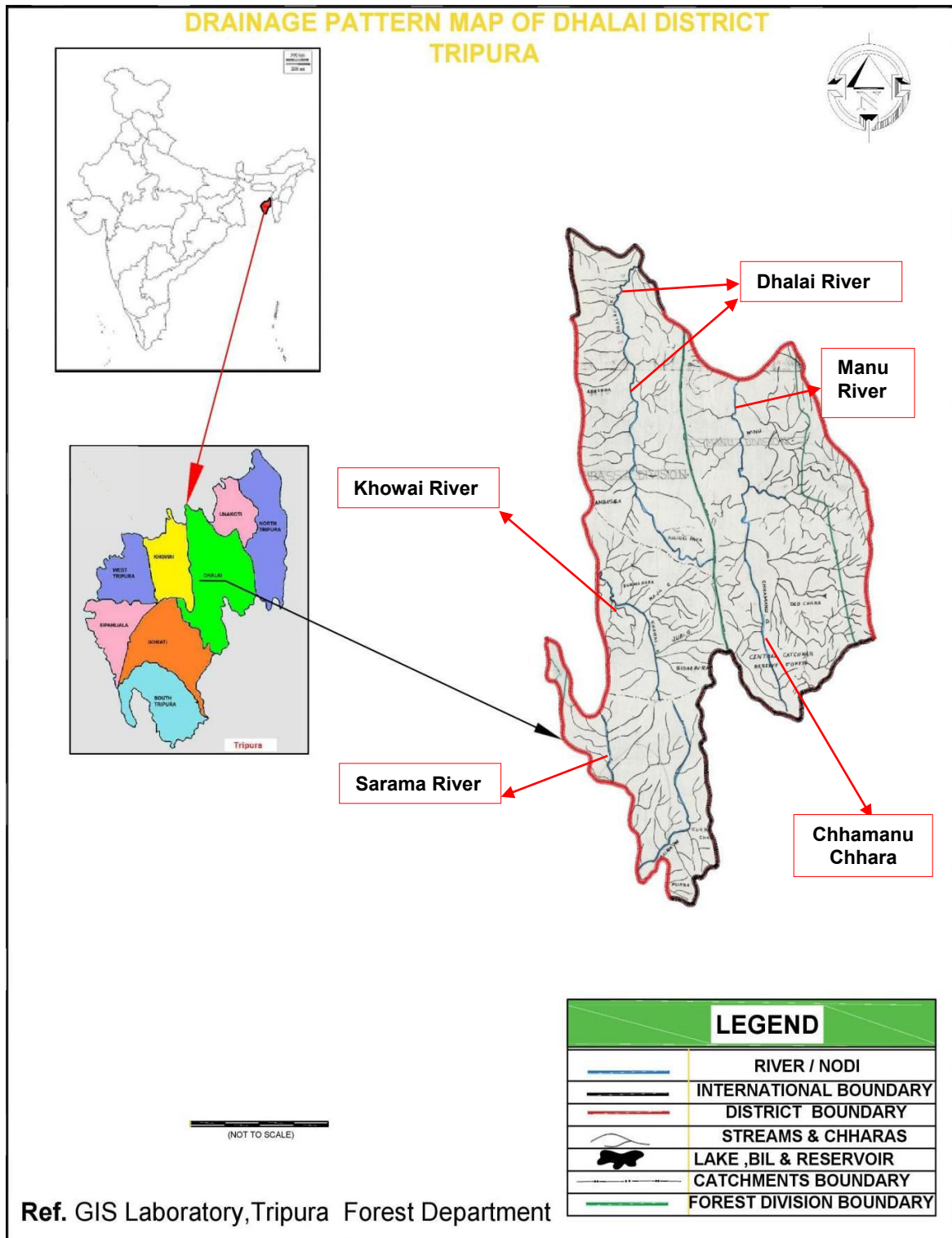
2.3.8 Major Rivers – Project Districts:

Table 2-6: Major Rivers Flowing Through Project Districts

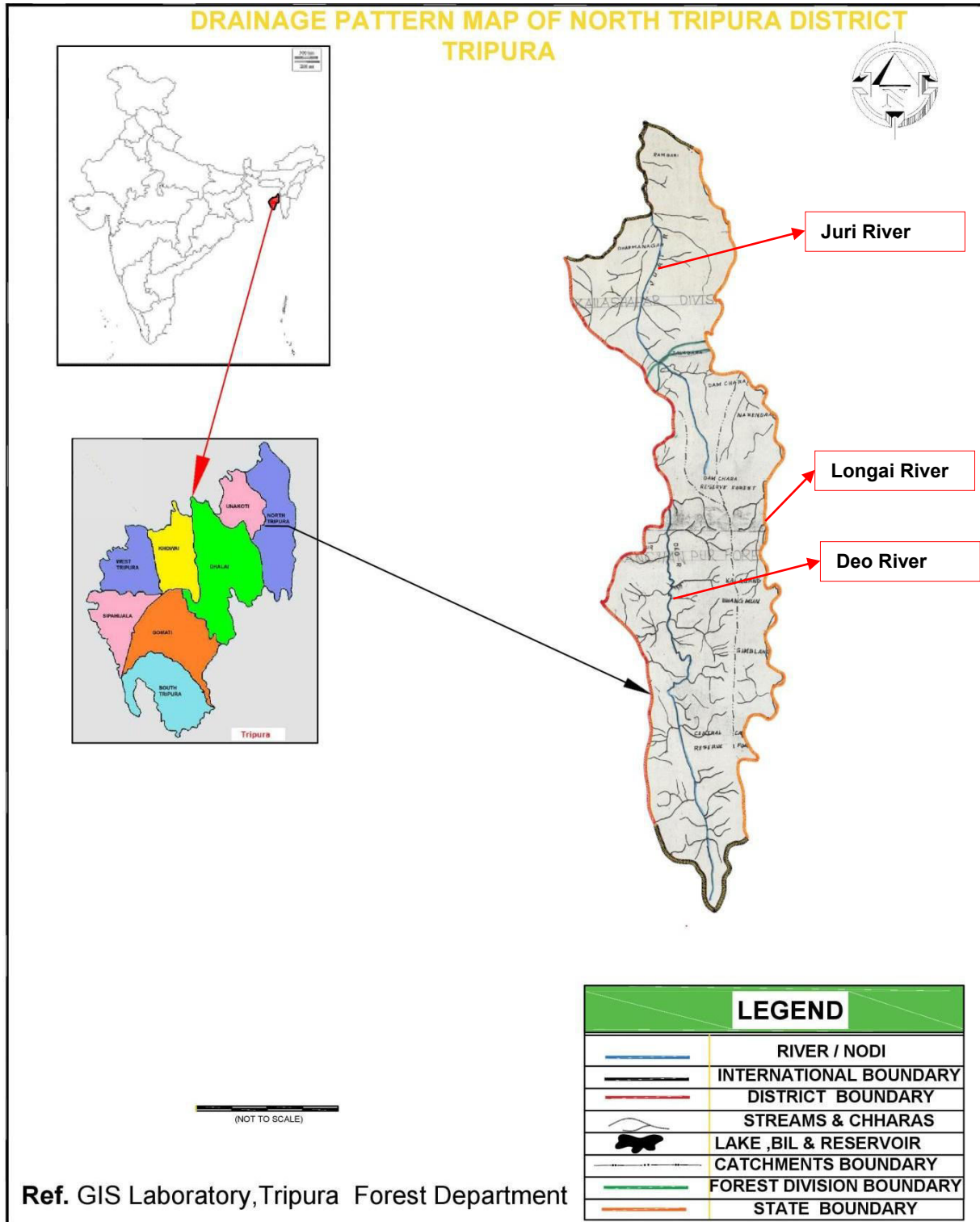
Sr. No.	Name of District	Name of River
1	Dhalai	Dhalai, Manu, Khowai and their perennial tributaries Beside that there are cherras viz., Jarulchhara, Kanchanchhara etc.
2	North Tripura	Longai, Juri, Deo and their perennial tributaries
3	Unakoti	Manu & Deo River and their perennial tributaries Beside that there are cherras viz., Kathal, Dem, Danga, Hamuk, Kuki, Longtarai, Baghai, Kanchan etc

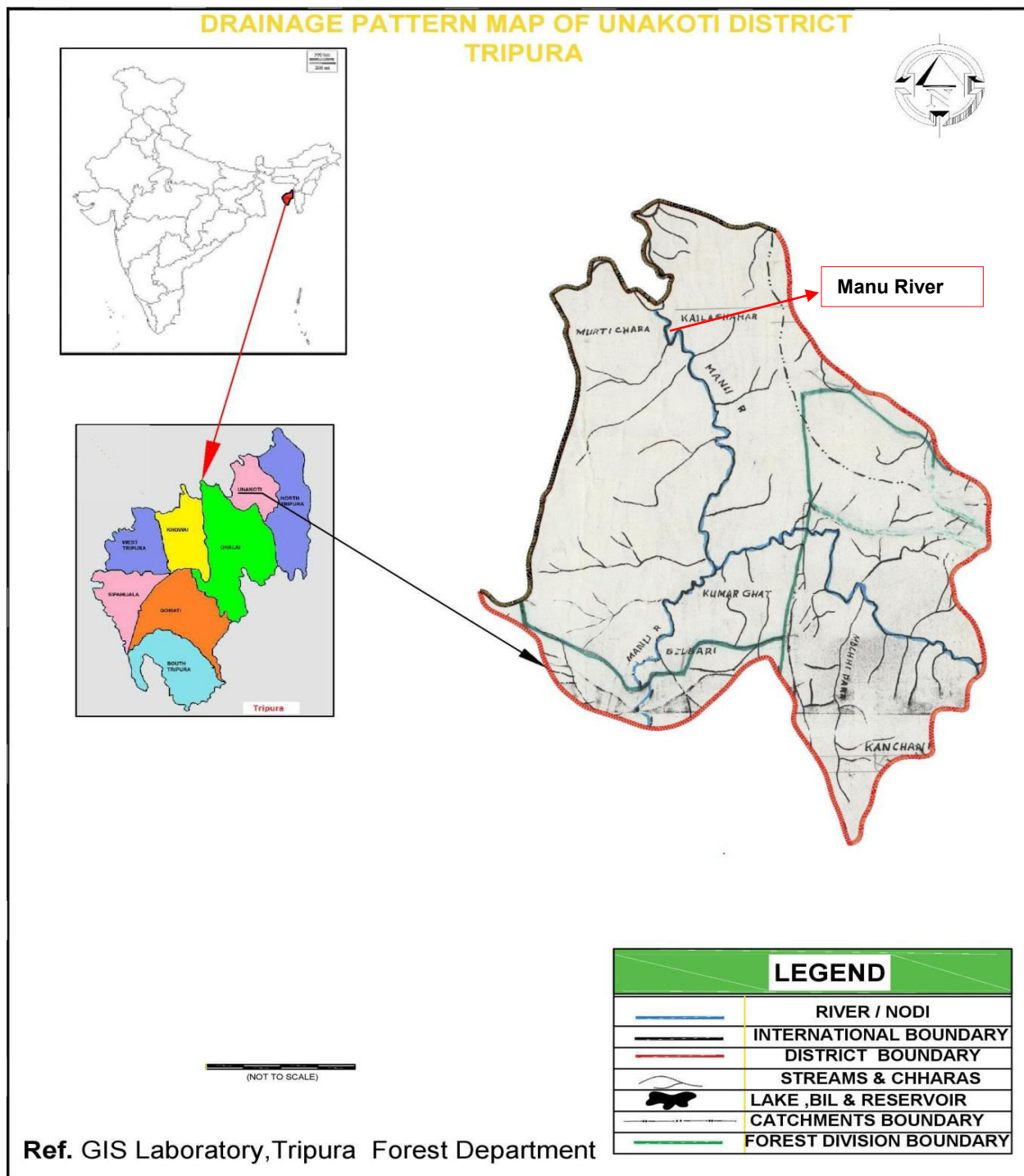
The subproject activity / route alignment which is coming near water body or crossing water body are assessed and discussed in the Chapter 4 and 5 with EMP. The River Maps of Project Districts are depicted in **Maps 2.9 through 2.11**. The maps are prepared by Forest Department, GoT, 2016. For FEAR II maps are referred from District Profile reports, GoT, 2018-2019.

Map 2-9: Drainage Pattern Map of Dhalai District



Map 2-10: Drainage Pattern Map of North Tripura District



Map 2-11: Drainage Pattern Map of Unakoti District


2.3.9 Wetlands – Tripura State¹⁵:

In Tripura, 432 wetlands have been mapped and 2983 small wetlands (< 2.25 ha) identified. Total wetland area estimated is 17542 ha. Inland natural wetlands dominated in the state with 63% share. The major natural wetland types are; river/stream (42.30%) and waterlogged (16.79%). There are 60 lake/pond with about 1.7% area. Under man-made wetlands, reservoir/barrage is the major wetland type with 18.93% share. The details of type-wise aerial extents of wetland are given in the **Table 2-7**. Tripura has seven wetlands important in the

¹⁵ Ministry of Environment, Forests & Climate Change, National Wetland Atlas: Tripura, Govt of India

context of state. These are Rudra Sagar, Gomti Reservoir (Dumbur Lake), Sepahijala Reservoir, Trishna, Sattar Mia's Hoar, Batapura Lake and College Tilla Lake. Amongst there Rudra Sagar Lake and Gomati Reservoir are identified wetlands under National Wetlands Conservation Programme. The Rudrasagar lake of State is also covered under International Convention on wet land (Ramsar Convention).

Table 2-7: Wetland Details – Tripura State

Area in ha

Sr. No.	Wett code	Wetland Category	Number of Wetlands	Total Wetland area	% of wetland area	Open Water	
						Post monsoon area	Pre monsoon area
	1100	Inland Wetlands – Natural					
1	1101	Lakes/Ponds	60	300	1.71	180	153
2	1102	Ox-bow lakes/ Cut-off meanders	78	387	2.21	229	170
3	1105	Waterlogged	244	2946	16.79	1872	647
4	1106	River/Stream	17	7420	42.30	4488	5115
	1200	Inland Wetlands -Man-made					
5	1201	Reservoirs/Barrages	12	3320	18.93	2936	796
6	1202	Tanks/Ponds	21	186	1.06	142	142
		Sub-Total	432	14559	83.00	9847	7023
		Wetlands (<2.25 ha), mainly Tanks	2983	2983	17.00	-	-
		Total	3415	17542	100.00	9847	7023

2.3.10 Wetlands – Project Districts:

2.3.10.1 Dhalai District:

Total 77 wetlands mapped 349 small wetlands (<2.25ha) delineated as point features. The total wetland area is 4815 ha. The inland-Natural wetlands comprise about 43 % and inland-Man-made wetlands comprise about 50 % of wetland area. Reservoir/Barrage occupies the largest area (2383 ha) followed by River/Stream (1751 ha). The other major wetland types are waterlogged (264 ha) followed by Ox-Bow lakes (54 ha). Details of wetland statistics is given in **Table 2-8**. The open water spread of River/stream does not show significant seasonal change. However, in case of Reservoir/Barrage, the open water is significantly reduced during Pre-monsoon (587 ha) compared to post-monsoon (2211 ha).

2.3.10.2 North Tripura District (Including Unakoti District):

In the North Tripura district, 92 wetlands have been delineated in addition to 735 small wetlands (<2.25 ha) identified. The inland-Natural wetlands comprise about 70.9 % of total wetland area. River/stream is the dominant wetland type (58.6 %), followed by Waterlogged (8.3 %). The other major natural wetland type is Ox-Bow lakes (111 ha). Reservoir/Barrage is the major Man made wetland type. Total 3 are mapped under this category with 255 ha area that turns out to be 7.5 %. Detailed wetland statistics is given in **Table 2.9**. The open water spread in wetlands does not show significant seasonal variation, except for Reservoir/Barrages. The water spread in Reservoirs/Barrages reduced significantly (83 ha) during Pre-monsoon compared to post monsoon (206 ha).

Table 2-8: Wetland Details – Dhalai District

Area in ha

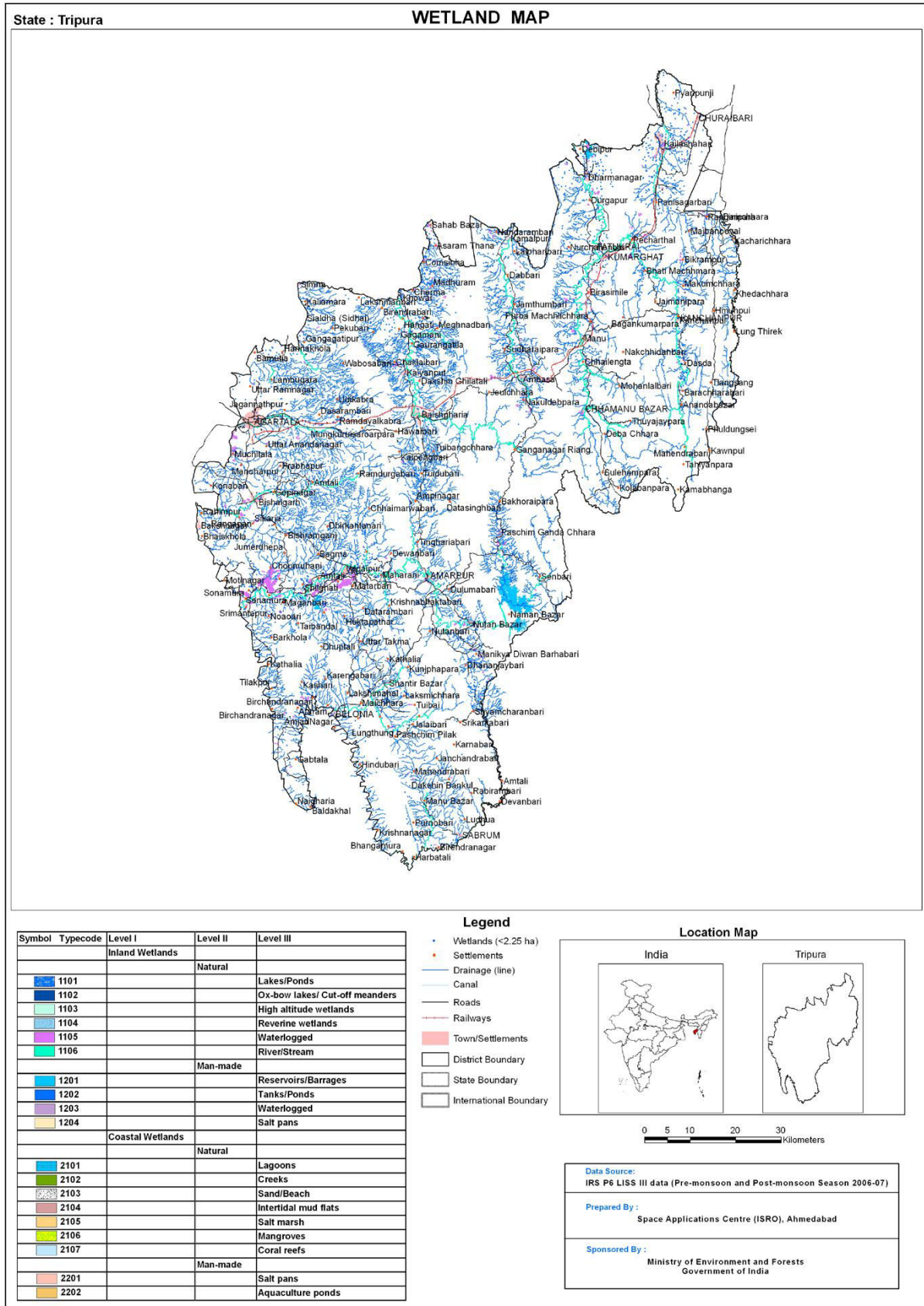
Sr. No.	Wett code	Wetland Category	Number of Wetlands	Total Wetland area	% of wetland area	Open Water	
						Post monsoon area	Pre monsoon area
	1100	Inland Wetlands – Natural					
1	1101	Lakes/Ponds	2	9	0.19	6	5
2	1102	Ox-bow lakes/ Cut-off meanders	13	54	1.12	34	19
3	1105	Waterlogged	50	264	5.48	114	118
4	1106	River/Stream	6	1751	36.37	991	1130
	1200	Inland Wetlands -Man-made					
5	1201	Reservoirs/Barrages	5	2383	49.49	2211	587
6	1202	Tanks/Ponds	1	5	0.10	5	5
Sub-Total			77	4466	92.75	3361	1864
Wetlands (<2.25 ha), mainly Tanks			349	349	7.25	-	-
Total			426	4815	100.00	3361	186

Table 2-9: Wetland Details – North Tripura District (Including Unakoti District)

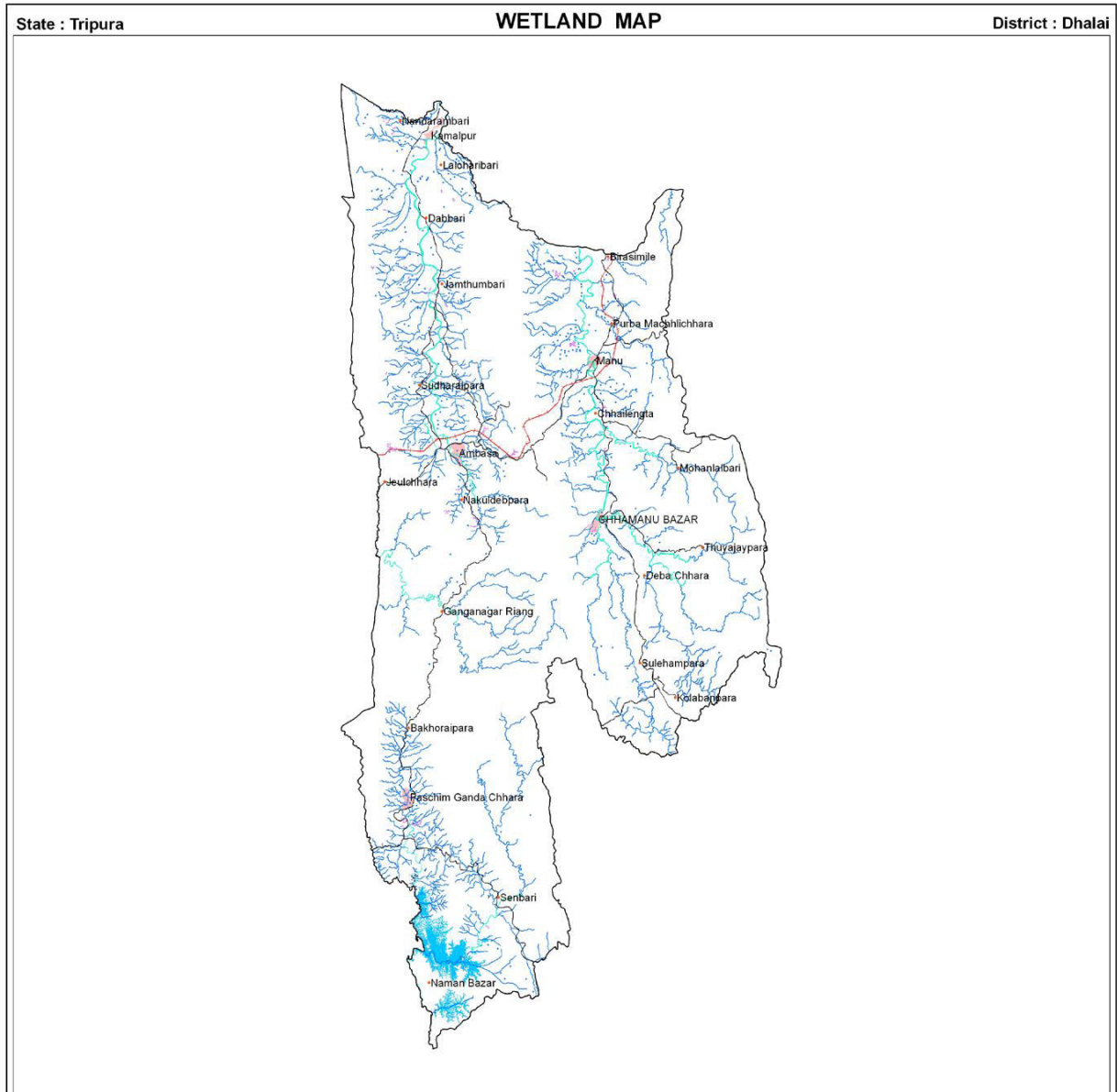
Area in ha

Sr. No.	Wett code	Wetland Category	Number of Wetlands	Total Wetland area	% of wetland area	Open Water	
						Post monsoon area	Pre monsoon area
	1100	Inland Wetlands – Natural					
1	1101	Lakes/Ponds	6	25	0.73	12	13
2	1102	Ox-bow lakes/ Cut-off meanders	26	111	3.26	55	47
3	1105	Waterlogged	51	282	8.28	128	126
4	1106	River/Stream	6	1996	58.64	1180	1215
	1200	Inland Wetlands -Man-made					
5	1201	Reservoirs/Barrages	3	255	7.49	207	83
6	1202	Tanks/Ponds	-	-	-	-	-
Sub-Total			92	2669	78.41	1582	1484
Wetlands (<2.25 ha), mainly Tanks			735	735	21.59	-	-
Total			827	3404	100.00	1582	1484

Map 2-12: Wetland Map of Tripura State



Map 2-13: Wetland Map of Dhalai District

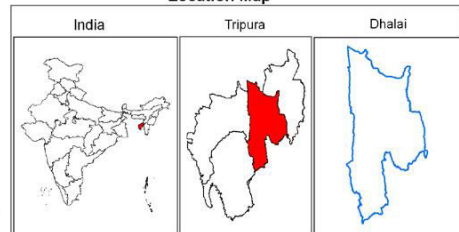


Symbol	Typecode	Level I	Level II	Level III
		Inland Wetlands		
			Natural	
	1101			Lakes/Ponds
	1102			Ox-bow lakes/ Cut-off meanders
	1103			High altitude wetlands
	1104			Reverine wetlands
	1105			Waterlogged
	1106			River/Stream
			Man-made	
	1201			Reservoirs/Barrages
	1202			Tanks/Ponds
	1203			Waterlogged
	1204			Salt pans
		Coastal Wetlands		
			Natural	
	2101			Lagoons
	2102			Creeks
	2103			Sand/Beach
	2104			Intertidal mud flats
	2105			Salt marsh
	2106			Mangroves
	2107			Coral reefs
			Man-made	
	2201			Salt pans
	2202			Aquaculture ponds

Legend

- Wetlands (<2.25 ha)
- Settlements
- Drainage (line)
- Canal
- Roads
- Railways
- Town/Settlements
- District Boundary
- State Boundary
- International Boundary

Location Map

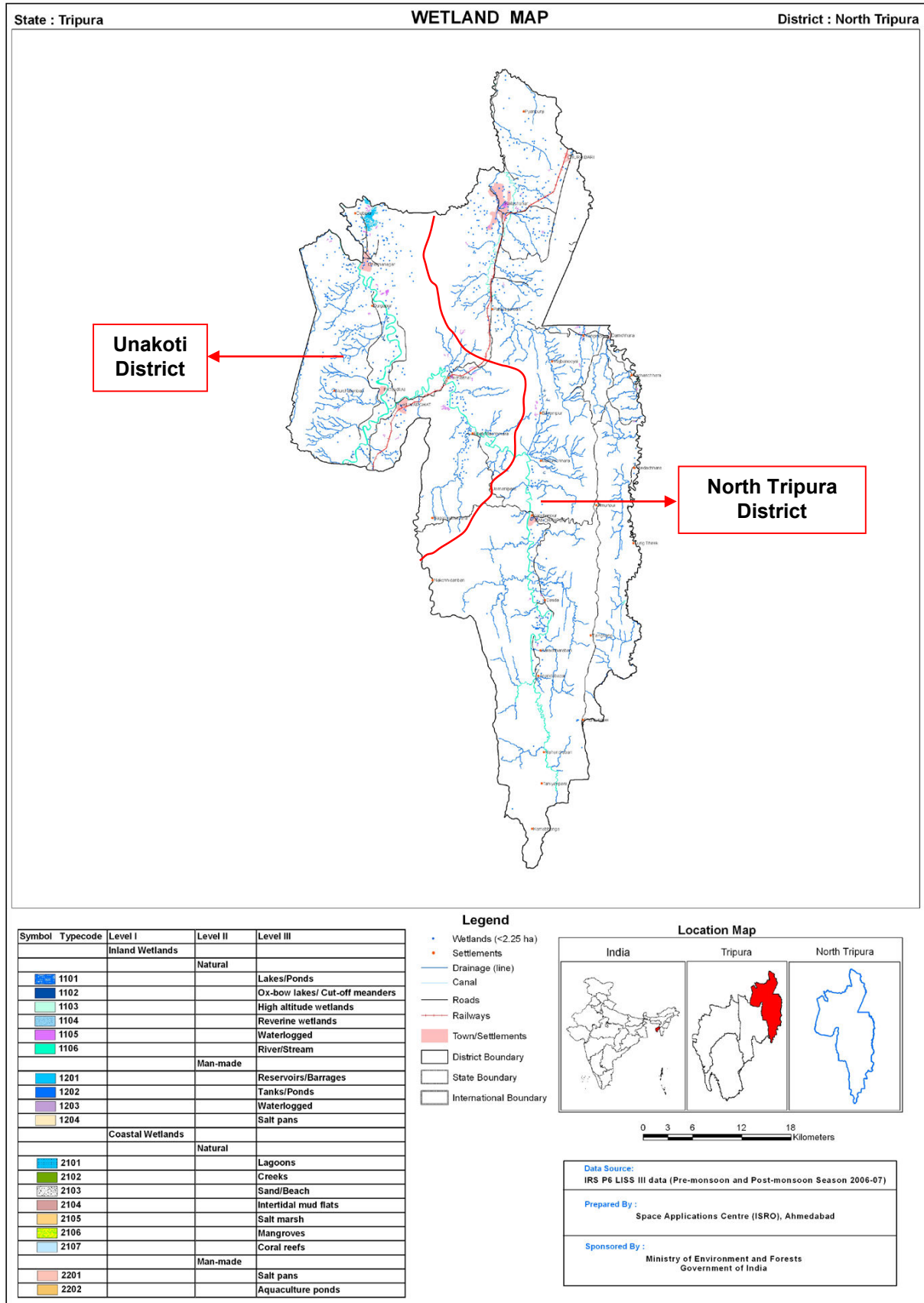


Data Source: IRS P6 LISS III data (Pre-monsoon and Post-monsoon Season 2006-07)

Prepared By: Space Applications Centre (ISRO), Ahmedabad

Sponsored By: Ministry of Environment and Forests, Government of India

Map 2-14: Wetland Map of North Tripura District (Including Unakoti District)



2.3.11 Soils

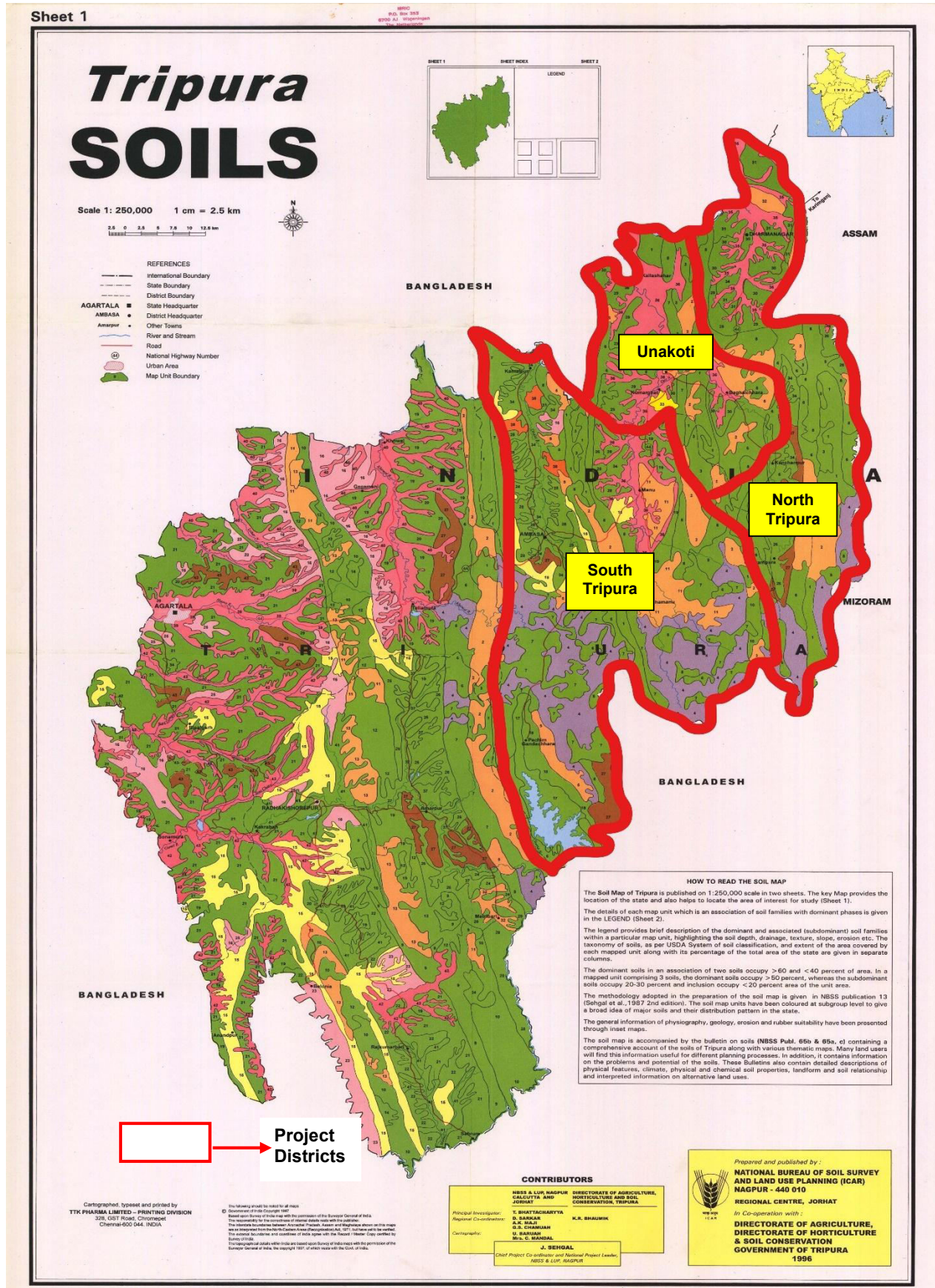
The factors influencing the prevalence of different types of soil in Tripura include topographical changes, climate changes, prevalent rock materials and the vegetation. Soil erosion caused by chemical weathering of the soil in the State of Tripura has led to the bed rock of the region being revealed.

The soil covers a total area of 4,514 Sq. Km. The soil in Tripura can be classified into five distinct categories. 43.07 % of the total land area of the state is occupied by the red loamy soil and the sandy soil. The reddish yellow brown sandy soil of the region covers a total area of 3,468 square kilometers in the state of Tripura. The soil type is the second most dominant type in the region covering 33.06 % of the land area. The three other types of soil that prevail in the region are the lateritic soil, younger alluvial soil and the older alluvial soil.

The soil taxonomic (family) classification map of project districts was prepared as per the data by National Bureau of Soil Survey & Land Use Planning (NBSS&LUP). Soil map is given in **Map 2-15**. The details of Soil Taxonomic Classification are given in **Appendix A under heading C**.

According to **Soil Taxonomic Classification**, Soil Unit 21 is the most dominant Group (12.4%) which is characterized by deep, moderately well drained, fine loamy soils on gently sloping undulating plains with low mounds having loamy surface with moderate erosion hazard. Rest all the soil units covers less than 10% of the project districts. The major taxonomic categories are *Typic Dystrochrepts*, *Typic Haplumbrepts*, *Typic Epiaquepts*, *Typic Hapludults*, *Typic Udorthents*.

Map 2-15: Soil Map of Tripura State with Project Districts



2.3.12 Minerals

Of the total geographical area of Tripura, 76% can be marked as of “Tertiary” origin and 24% belong to Quaternary period; none of these contain any major mineral resource. In Tripura, the mineral resources are mainly glass sands, limestone, plastic clay and hard rock; all of these materials are being used to a variable degree. However, the single most important resource in the state is oil and natural gas. Oil and Natural Gas Commission (ONGC) has initiated massive exploration programme in the State. Mineral Map of Tripura is depicted in **Figure 2-5**.

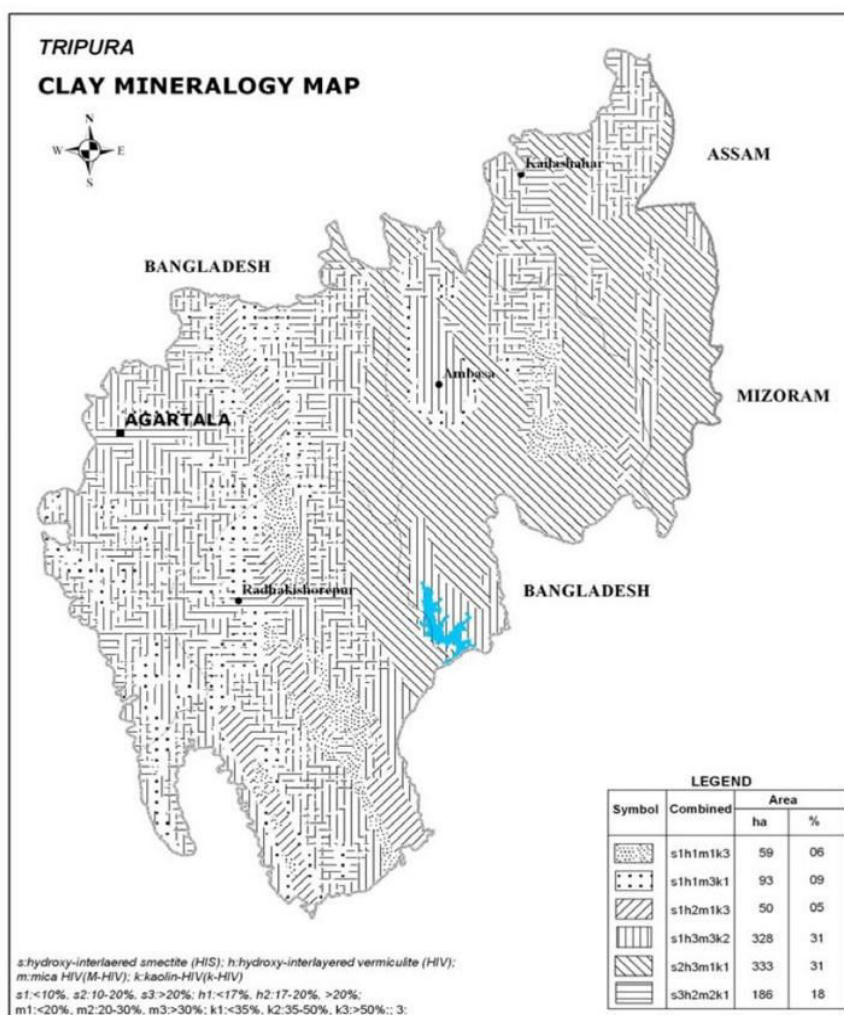


Figure 2-5: Mineral Map of Tripura

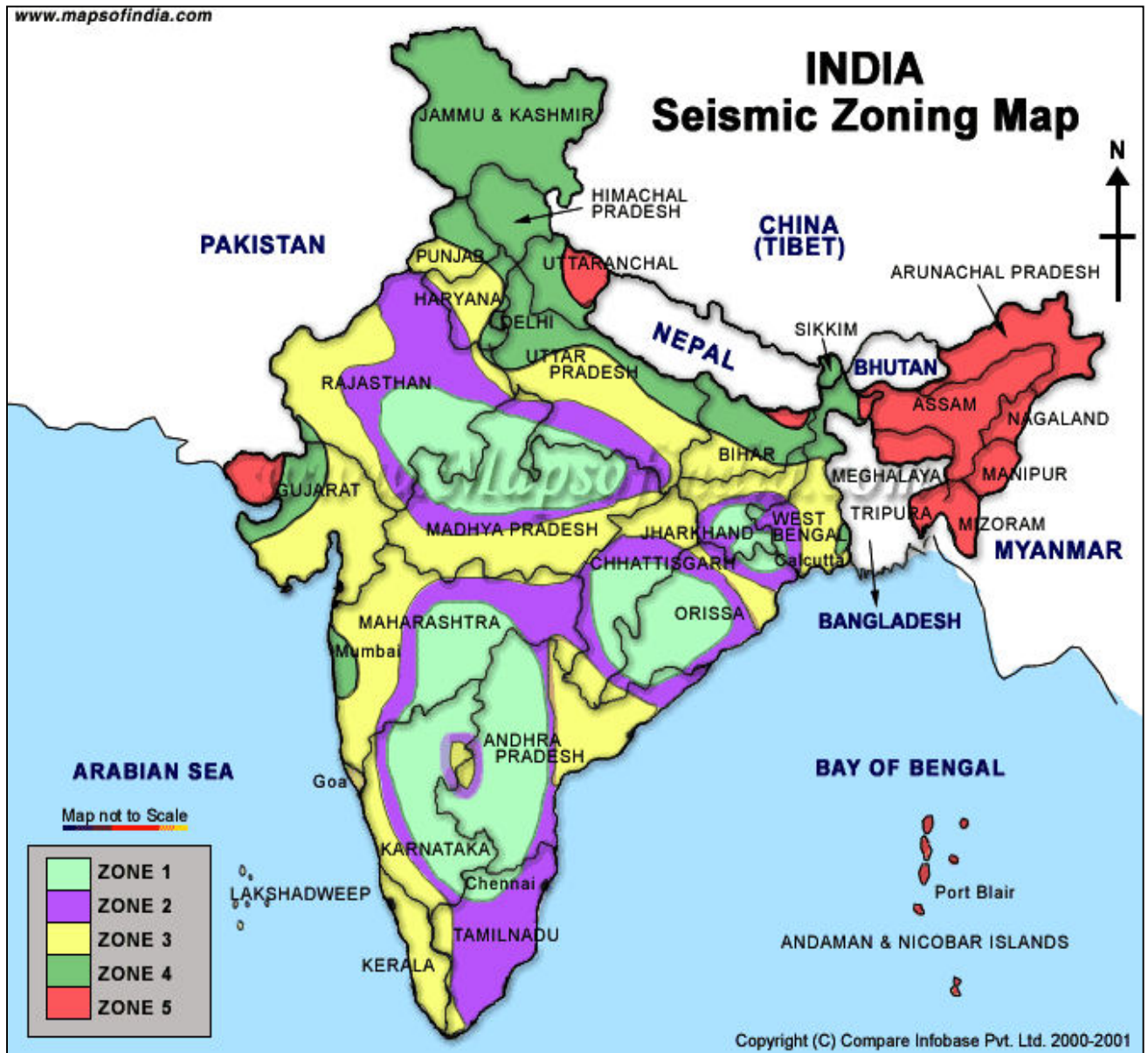
2.3.13 Vulnerability

2.3.13.1 Earthquake Vulnerability¹⁶:

Tripura and the rest of the northeastern region lie in the zone-V of the seismological map of India, which is regarded as a high-risk zone with respect to earthquakes. Associated vulnerability is studied in detailed for each alignment of the project TL and DL and same are discussed in the **Section 4.3**.

¹⁶ ENVIS Tripura

Map 2-16: Seismic Map of India



2.3.13.2 Landslide Vulnerability:

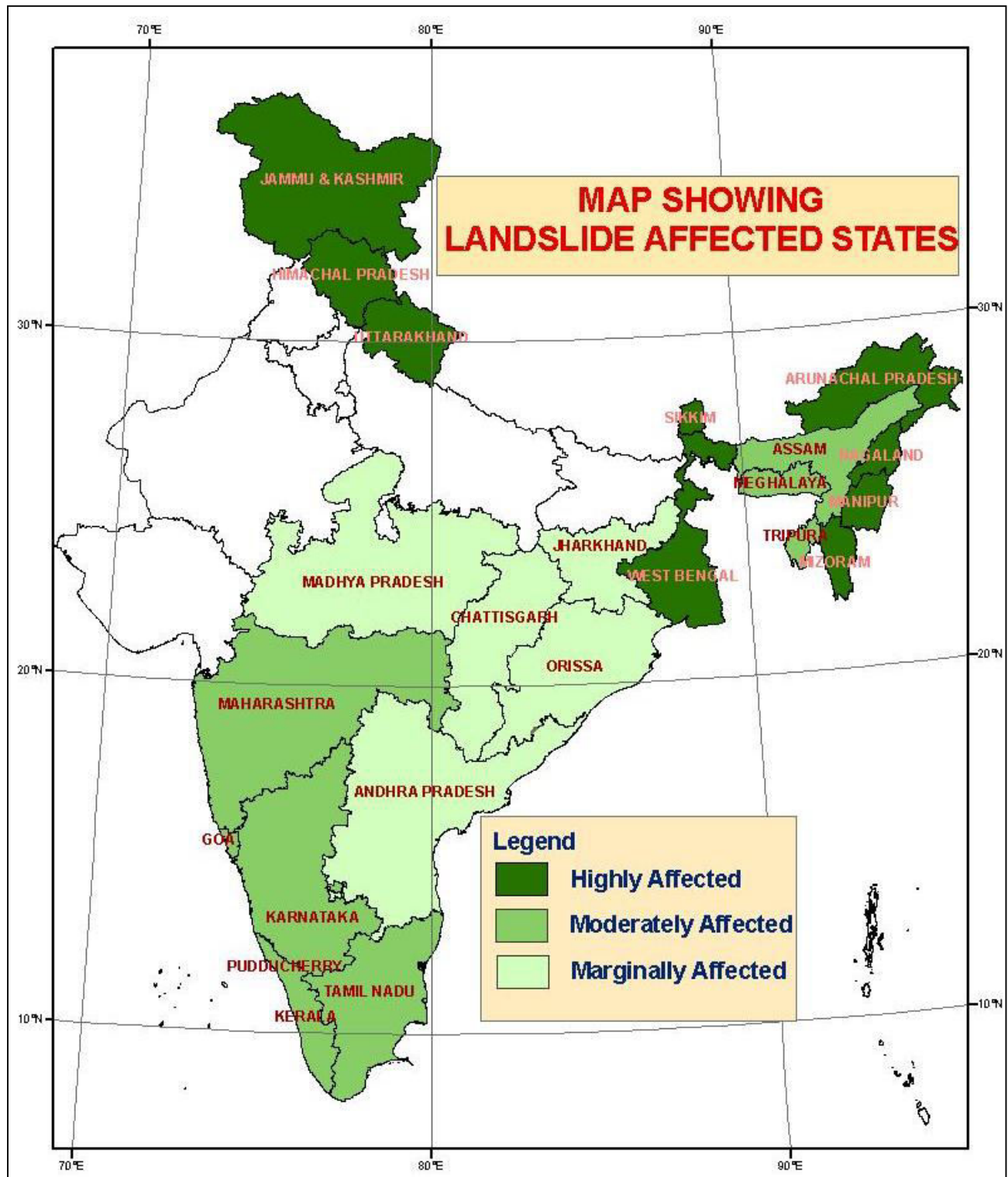
Landslide hazard stands as the second geological hazard following earthquake (Li, et. al., 1999; the U.S. Geological Survey, 2000). The Food and Agriculture Organization of the United Nations (FAO) states that steep terrain, vulnerable soil, heavy rainfall and earthquake activities make large parts of Asia highly susceptible to landslides. An area of about 0.49 million sq km out of the total area of India is vulnerable to landslide and about 0.098 sq km of an area in Northeast India is vulnerable to landslide. Tripura State comes under moderately affected landslide hazard class (**Map 2.17**)¹⁷.

Landslide, a common phenomenon in hilly region is one of the most important factors of soil erosion. Topsoil and vegetative covers on large scale are considerably lost every year during the monsoon season. Landslides are mainly found below settlement areas, terrace fields, rolling Jhum land and road construction. The possible factors responsible for landslide occurrence

¹⁷ <http://appscmaterial.blogspot.in/2012/02/disaster-managementlandslides.html>

may be singular or a combination of several factors. Some of the factors responsible for landslide in Tripura are:

Map 2-17: Landslide Map of India



Soil formations: Clayey and shales have low hydraulic conductivity and can be difficult to drain. On the other hand, when the dip angle of the shale is along the slope, the soils over the shale are more susceptible to landslide. Most of the slides in the area are caused due to this

reason. It is also observed that during rainy season the shallow soils lying above shale bed are prone to landslide. Please refer **Soil Section 2.3.11**.

Increase in the Runoff Volume: It affects the regimes of the natural downhill drains and toe cutting has been observed in many cases. Such toe cutting leads to slope failure near these natural drains. Slope failure occurring near these drains adversely affects the stability of the slope in general and leads to repeated slope failure in that area. Such toe failure also leads to blockage of drains promoting infiltration of water into the ground causing saturation of the soil, which adversely affects the stability. During the summer season, more specifically from June to October, the rainfall is heavy and almost continuous. So, permeable materials get saturated due to long continued heavy rains that, instead of the pelting rain driving individual particles in the form of 'rill' or 'rain-wash' down the slope, the whole of the surficial materials becomes a mass of mud and debris.

Faulty Road Construction: Another important factor causing landslides, it has aggravated the intensity of landslide. One of the main reasons for this is the slope cutting process while constructing the road as it disturbed the slope stability. Most of these slide areas remain weak with mud flow and sinking of highways occur every monsoon season due to the composition of loose sand and dark brown clays where water seepage is quite high.

Urbanization: Due to increasing urbanization and demand for land in the city area, and lack of enforcement of development controls, people have started construction even on the valley lines, completely blocking the drainage path in some cases. These drains need to cross the road system in several stages through culverts. Eroded soils and garbage carried down by water during torrential rainy season block many a time cross drains and lead to overflowing of water onto the road. Increasing urbanization has also increased the surface runoff because extension in the pucca ground cover or black topping through the construction of building, courtyards, roads, pavements, etc., reduces infiltration of rainwater significantly and increases surface runoff, thereby increasing the volume and discharge in the area and drain which in turn remove the top soil rapidly and also cause landslide in the areas. In the instant scheme, during construction limited quantity of excavated material is generated from tower/pole foundations and sub-station foundation. However, adequate mitigation measures have been given in the EMP and same are being undertaken to avoid any chances of landslide. In addition, excavation is avoided in rainy days. So far there are no instances of landslide due to any of the construction activity. Landslide due to operation and maintenance is not at all expected. The details are discussed in Chapter 4 for each project line.

2.3.13.3 Erosion Vulnerability¹⁸:

Unscientific land utilization incompatible with its carrying capacity leads to land degradation which has both environmental and economic consequences. The information on land degradation is needed for a variety of purposes like planning reclamation programs, rational land use planning, for bringing additional areas into cultivation, to improve productivity levels in degraded lands etc. As per the land degradation mapping undertaken by Department of Space, GoI along with partner institutions under National Natural Resources Census (NRC), water and wind are the most important land degradation process that occurs on the surface of the earth. Rainfall, soil, physical properties, terrain slope, land cover and management practices

¹⁸ State Level perspective plan for watershed development in Tripura-2019, NBSS & LUP, Nagpur-2018

play a significant role in soil erosion. Some of the factors responsible for soil erosion in Tripura are:

Sheet Erosion: It is a common problem resulting from loss of topsoil. The soil particles are removed from the whole soil surface on a uniform basis in the form of thin layers. The severity of the problem is often difficult to visualize with naked eyes in the field.

Rill Erosion: When sheet erosion is severe and the surface runoff goes in the form of a concentric flow, tiny water channels are formed in the field called rills. Rills are generally associated with the cultivated lands and are visible in the ploughed soil after first heavy showers.

Gully Erosion: Gullies are formed as a result of localized surface run-off affecting the unconsolidated material resulting in the formation of perceptible channels causing undulating terrain. They are commonly found in sloping lands, developed as a result of concentrated run-off over fairly long time. They are mostly associated with stream courses, sloping grounds with good rainfall regions and foothill regions.

Landslide/ Landslip Erosion: The region is quite prone to landslides/ landslips that take a heavy toll on valuable lands, property and life besides aggravating the problem of soil erosion. Factor responsible for landslide have already been explained in earlier section.

Faulty Road Construction: As explained in earlier section.

Unscientific Disposal of Debris Generated by Road Construction: Roads are the only means of communication and form an important development activity in the region. Road construction in the mountainous terrain requires a lot of blasting and construction in a zigzag fashion. The debris thus produced is not properly disposed at dumping sites and is just pushed onto the river side slopes. This results in heavy erosion during the rainy season.

Urbanization: As explained in earlier section.

For the assessment of soil erosion vulnerability hazard, NBSS&LUP report on soil erosion (2011) and State Level respective plan of watershed development in Tripura (2012) are referred. all project TLs are falling in moderate to slight soil erosion zones. Please Refer **Map 2-18**. Landslide and erosion vulnerability is studied in detailed for each alignment of the project TL and DL and same are discussed in the **Section 4.3**. Adequate mitigation measures have been given in the EMP and same shall be followed to avoid any chances of getting affected by soil erosion vulnerable areas. In addition, any work shall be avoided in rainy days.

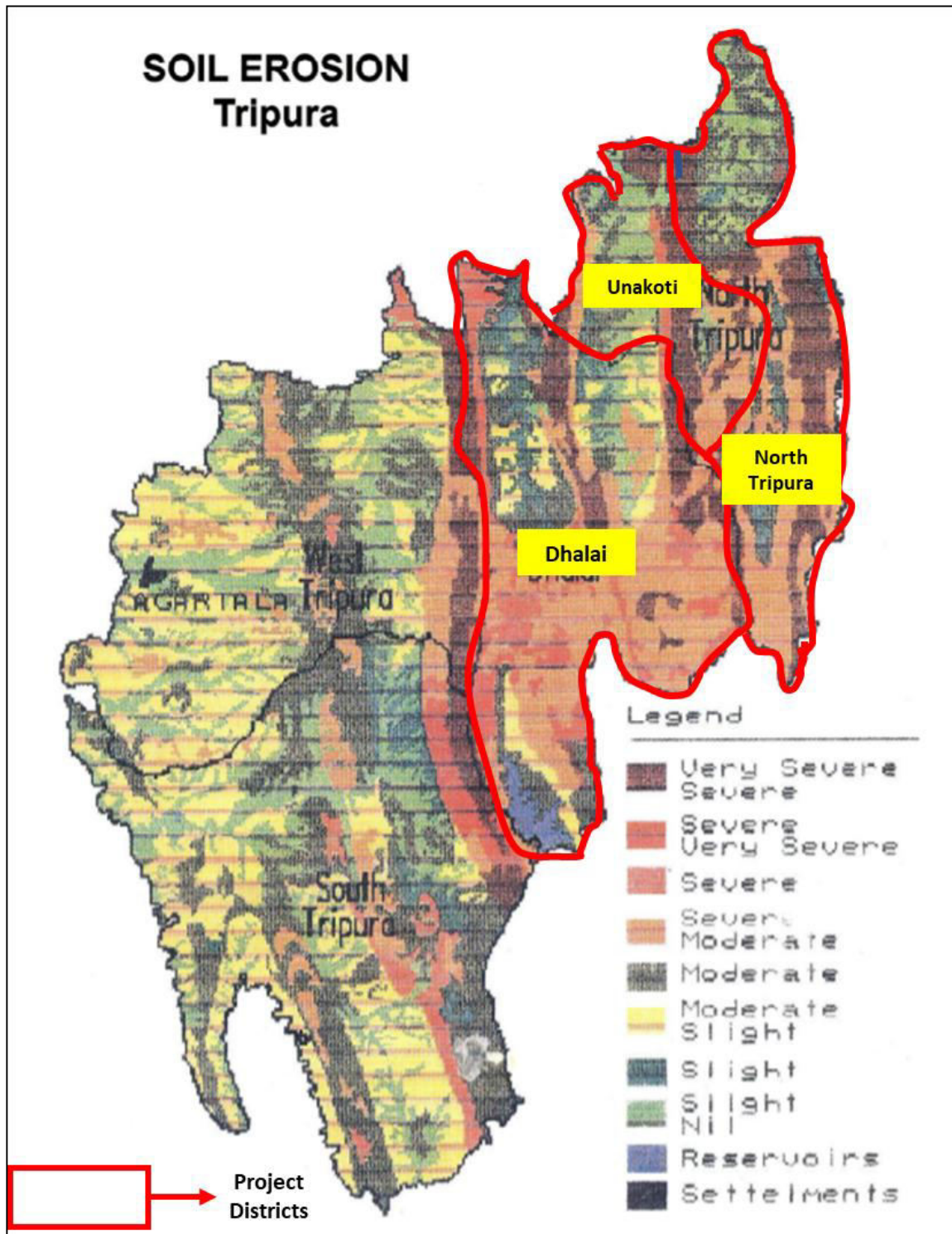
2.3.13.4 Flood Vulnerability¹⁹:

750 km² of land area of the State is considered to be flood prone. Nearly all the rivers are rain-fed and are prone to flood. Drying up of perennial drainage courses and Transportation and deposition of sand, silt in the venerable pockets are the main reasons causing flood and inundation hazards. With reference to the State Level perspective plan for watershed development in Tripura and NBSS & LUP, Nagpur and Disaster Management Cell of GoT, it can be inferred that the project district Unakoti is moderately to severe flood prone area where

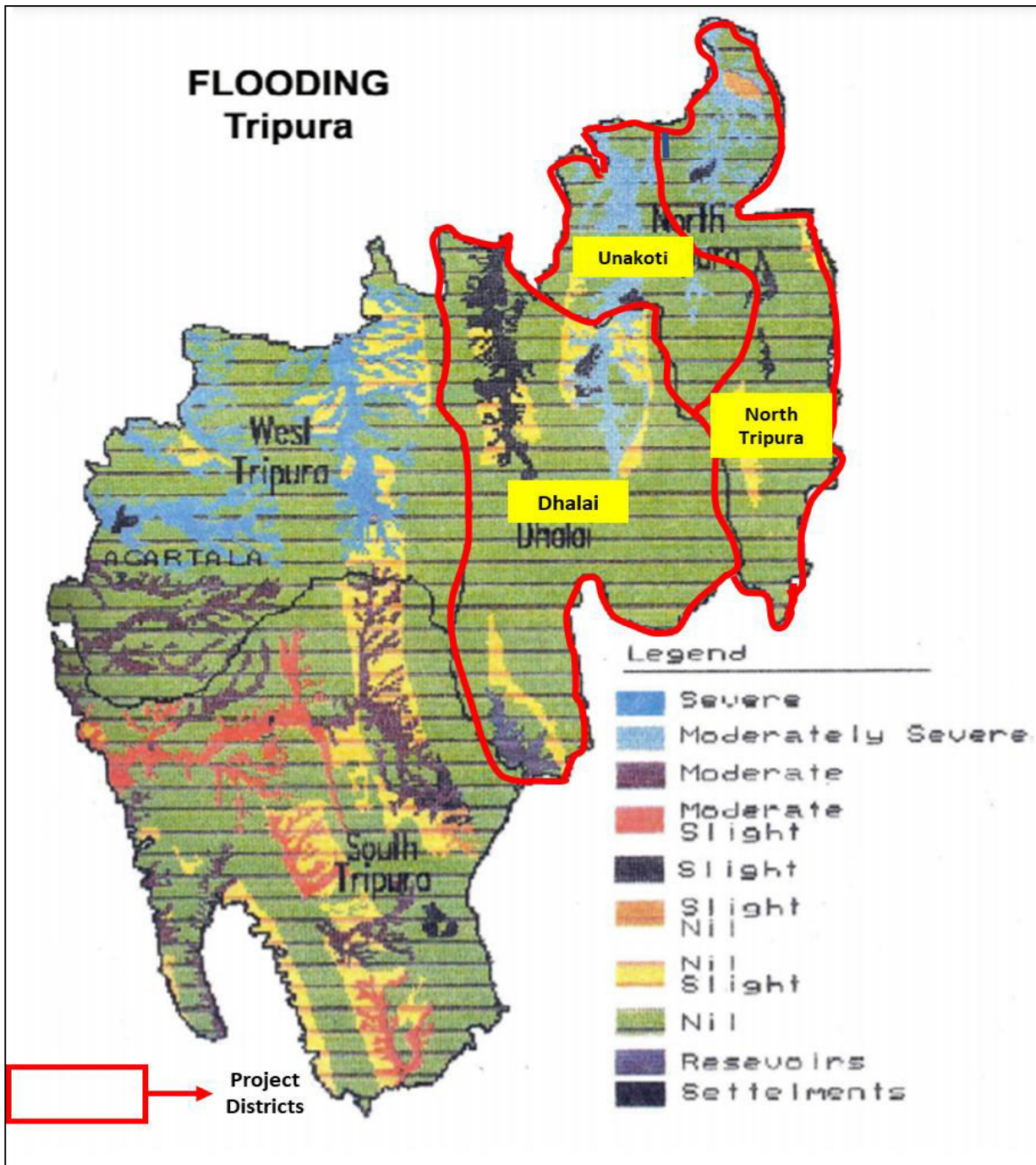
¹⁹ Disaster Management Cell of Tripura, GoT and NBSS&LUP Nagpur

Dhalai and North Tripura are nil to slight moderate flood prone area in Tripura State. Please Refer **Map 2-19**. Flood vulnerability is studied in detailed for each alignment of the project TL and DL and same are discussed in the **Section 4.3**. Adequate mitigation measures have been given in the EMP and same are followed to avoid any chances of getting affected by flood vulnerable areas. In addition, any work is avoided in rainy days.

Map 2-18: Soil Erosion Map of Tripura



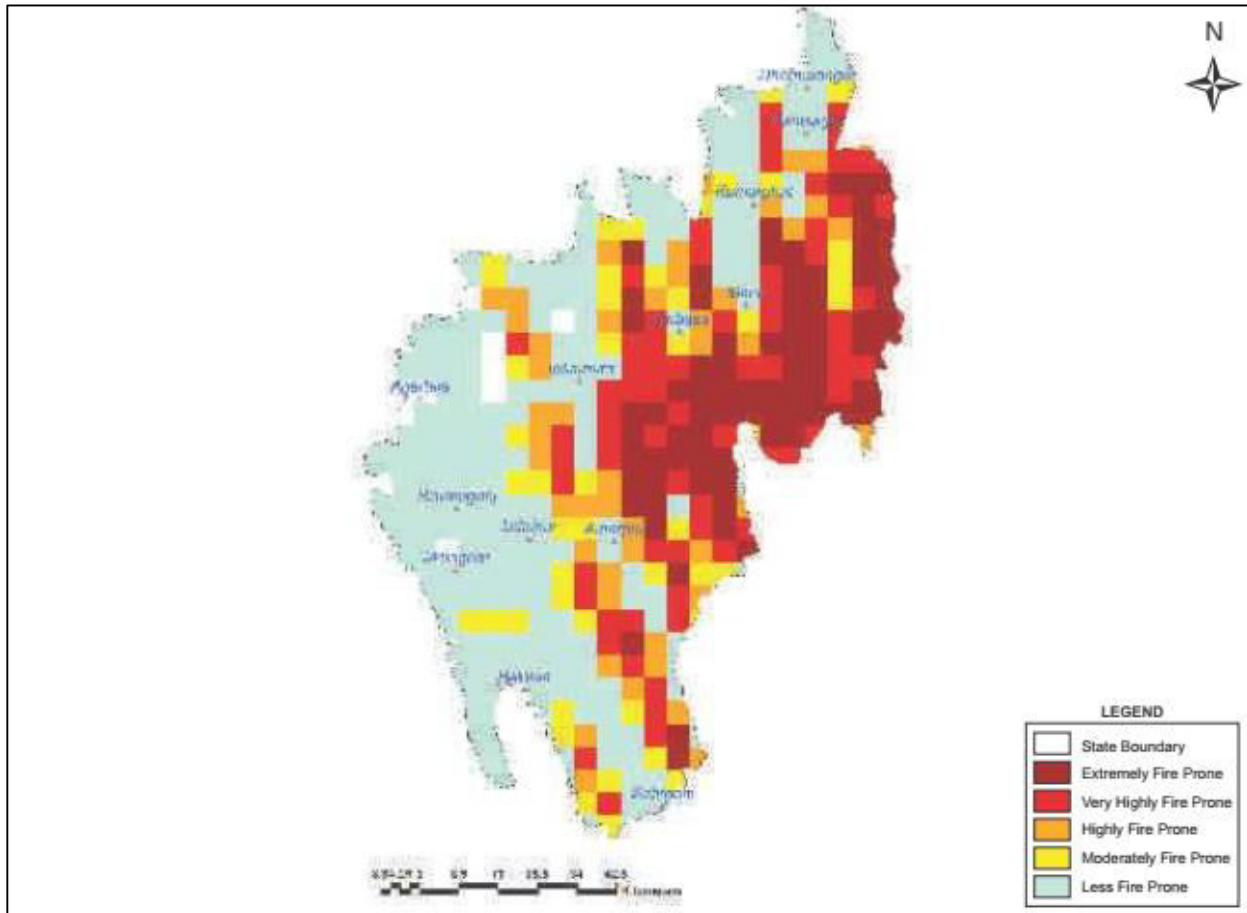
Map 2-19: Flood Map of Tripura



2.3.13.5 Fire Vulnerability²⁰:

Geographical area under different classes of forest fire proneness is given in the Map 2.20. It can be inferred that forest areas of southern part of Dhalai District and North Tripura District and maximum part of Unakoti district are extremely prone to fire. **Please refer Map 2-20.**

²⁰ Disaster Management Cell of Tripura, GoT and NBSS&LUP Nagpur

Map 2-20: Fire Prone Forest Areas Map of Tripura


2.4 Biological Environment

It is pertinent to mention that, in the present project, forest area/land covered under Forest (Conservation) Act, 1980 has been tried to avoided with careful selection of route alignment. All line routes and S/S locations have been selected in such a way that it successfully avoids any kind of PA and RF through meticulous site selection exercise. However, 100% avoidance of RF could not be attempted in TLs and DLs. Forest area of 14.3586 Ha of RF is involved in TL route of 132 kV D/C Kailasahar- Dharmanagar and 0.9973 Ha of RF in DL route of 132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New).

In order to analyse the impacts and plan mitigation measures, it is imperative to study baseline information for TL and surrounding or proximity area as well (study area), which includes forest areas under the control of individual / community / village councils. The same has been described in ensuing paragraphs.

2.4.1 Floristics – Tripura State²¹

The recorded forest area of the State is 6,294 sq. km based on the India State of Forest Report (ISFR), 2019, which constitutes 60% of its geographical area. Reserved forests constitute 66.33%, protected forests 2% and unclassed forests constitute 33.64%. The biological diversity of any geographical region is estimated at the level of ecosystem diversity, species diversity

²¹ Tripura Envis

and genetic diversity. Tripura being a part of North-East India, belongs to one of the two “Hot Spot” of India amongst 18 identified in the World.

At the ecosystem level, the State exhibits a part of Mountain ecosystem with moderate hill ranges and forest ecosystem. In between these two dominant ecosystems lies the freshwater ecosystem comprising 10 major rivers, numerous wetlands. Undulating high lands of narrow and broken plates cover extensive areas (Deb, 1975).

Forests in Tripura State are largely under the community and private forests. The Forest Department owns only certain areas classified as Reserved Forests, Protected Forests, Wildlife Sanctuaries, National parks, Nurseries & Botanical Gardens, therefore the department has purchased land from private owners for Biodiversity Conservation and taking up plantations under JICA Project²². The State has started ‘Joint Forest Management’²³ program to elicit active participation of villagers in creation, management and protection of plantations. Intensification of Forest Management was carried out in the State by creating adequate infrastructure and controlling the incidences of forest fire.

In Tripura state, during the period January 2015 to February 2017, forest cover was decreased by 164 sq. km is observed as per ISFR 2019. This can be attributed to shifting cultivation, harvesting of mature rubber plantations and other development activities for non-forestry purposes under the Forest Conservation Act, 1980 (MoEF&CC, 2019). In some cases, it can be attributed to change due to extension of area under rubber plantation²⁴.

2.4.1.1 Forest Cover

In terms of geographical area Tripura state has total 60% of Forest Area. The details are depicted in **Table 2.10**. As per the ISFR, 2019 by Forest Survey of India, the Forest cover is 6294 sq. km and forest canopy cover including include the private forest and community forest as well in the State is 7,726 sq. km. which is 73.68 % of the State's geographical area. In terms of forest canopy density classes, the State has 654 sq. km. under Very Dense Forest (VDF), 5,236 sq. km. under Moderately Dense Forest (MDF) and 1,836 sq. km. under Open Forest (OF). Please Refer **Table 2.11 and Figure 2.6**. Forest Map of the Tripura State is given as **Map 2-21**.

2.4.1.2 Forest Cover inside and outside Recorded Forest Area (Green Wash) ²⁵

The State has reported extent of recorded forest area (RFA) 6,294 sq. km. which is 60% of its geographical area. The reserved and unclassed forests are 66.33% and 33.64% of the recorded forest area in the State, respectively. **Please Refer Table 2.10**. Due to non-availability of digitized boundary of recorded forest (Canopy Cover - Green Wash) from the State, the updated Green Wash from Survey of India (SoI) toposheets which is 7,726 sq km has been used as proxy to the RFA boundary and the analysis of forest cover inside and outside this area is given below in **Table 2.12**.

²² Biodiversity Conservation Component, Tripura Biodiversity Board

²³ Joint Forest Management Committees, GoT, Tripura Forest Department

²⁴ India State of Forest Report (ISFR), 2019

²⁵ Indian State Forest Report, 2019

Table 2-10: Forest Area Classification – Tripura State.

Geographical Area (GA) Sq. Km.	Recorded Forest Area (RFA) Sq. Km.						Total RFA Sq. Km. in 2019	% Of GA
	RF	% RF	PF	% PF	UCF	% UCF		
10,486	4,175	66.33	2	0.03	2,117	33.64	6,294	60

RF: Reserved Forest (RF), Protected Forest (PF), Unclassed Forests (UCF)

Table 2-11: Forest Canopy Cover – Tripura State

Geographical Area (GA) Sq. Km	Forest Cover in Sq. Km. 2019						Total Area Sq. Km 2019	% Of GA
	VDF	%VDF	MDF	%MDF	OF	%OF		
10,486	654	6.24	5236	49.93	1836	17.51	7,726	73.68

Table 2-12: Forest Area Classification – Tripura State

	Forest Cover inside the Recorded Forest Area (or Green Wash)				Forest Cover inside the Recorded Forest Area (or Green Wash)			
	VDF	MDF	OF	Total	VDF	MDF	OF	Total
Area Sq. Km.	410	3,903	1,138	5,451	244	1,333	698	2,275
Area (%)	7.52	71.60	20.88	100.00	10.73	58.59	30.68	100.00

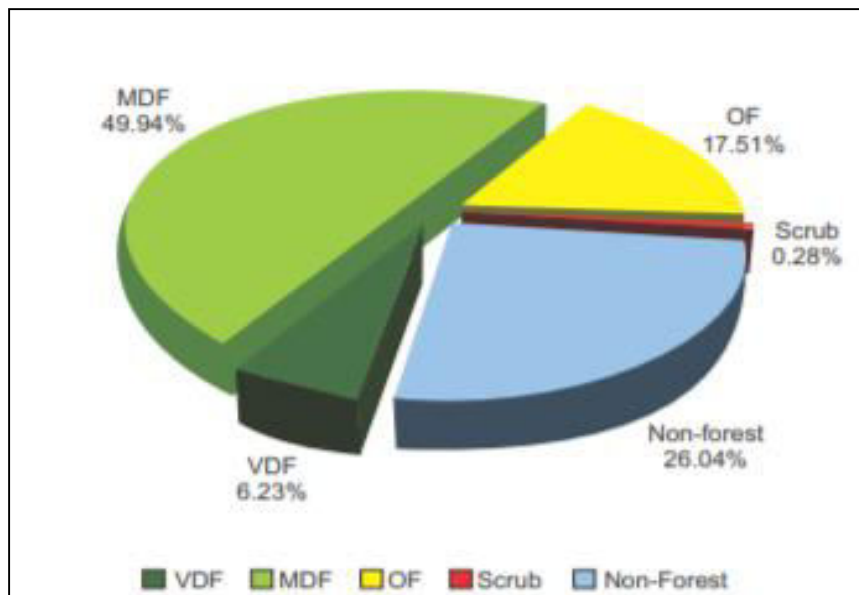


Figure 2-6: Forest Cover of Tripura State

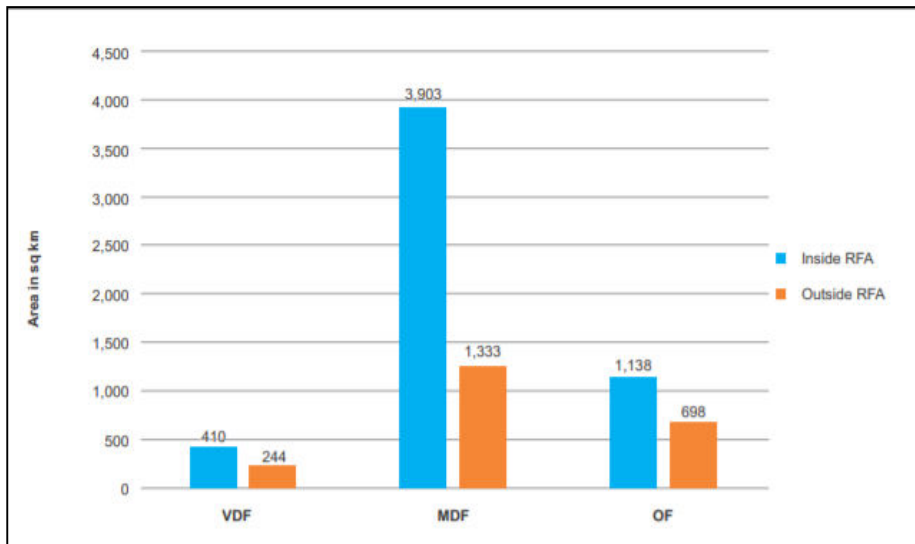
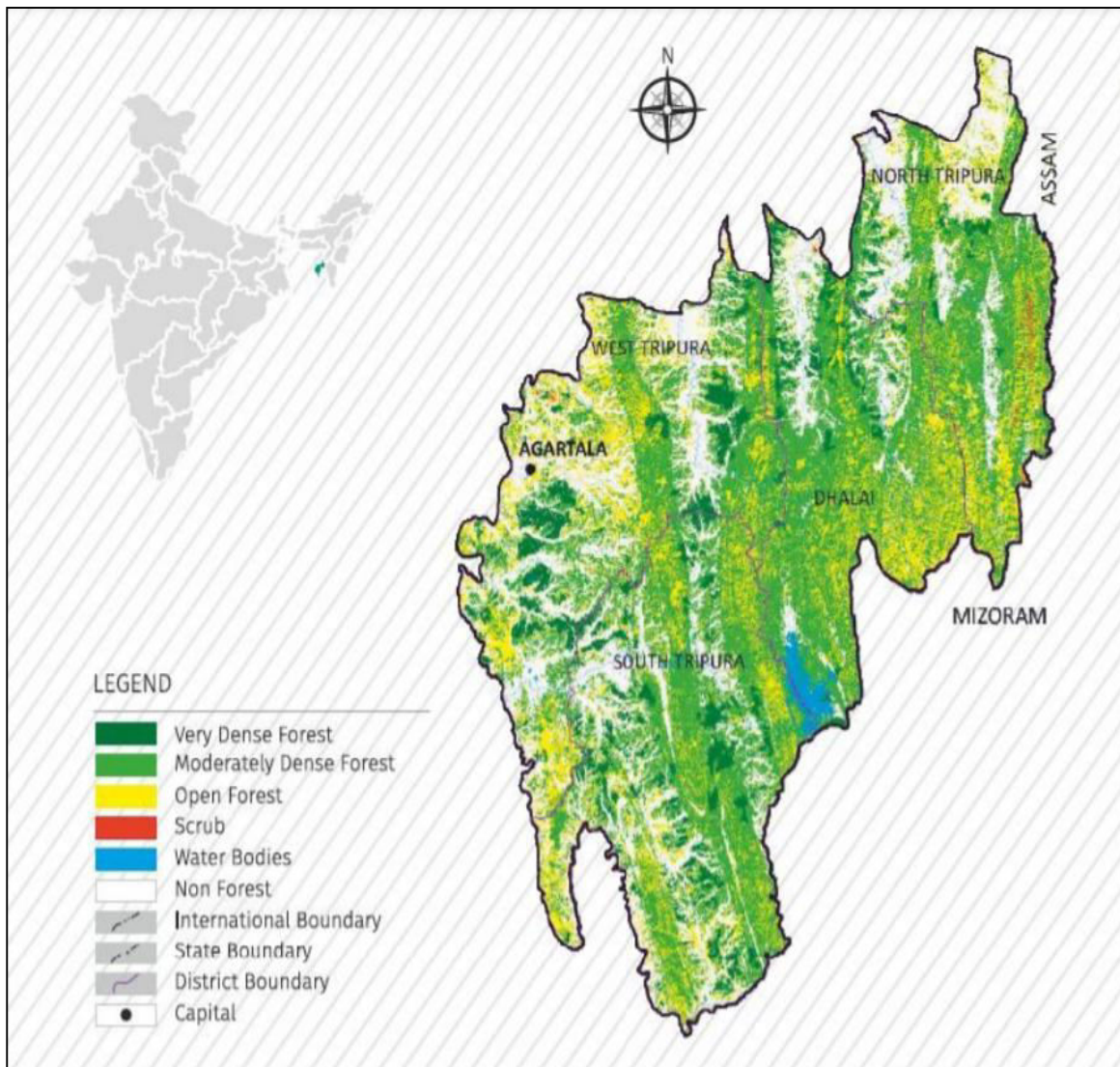


Figure 2-7: Forest Cover Inside and Outside RFA

Map 2-21: Forest Map of Tripura State²⁶



²⁶ Indian State Forest Report, 2019

2.4.1.3 Forest Types²⁷

Tripura state has been endowed with a wide variety of forest types on account of its unique geographic location and wide range of physiographic terrain. Tripura has 6 forest types as per the Champion & Seth classification (1968). Latest details of Forest Survey of India (FSI) are presented in the following **Table 2.13**.

Table 2-13: Details of forests in Tripura

Sr. No.	Types of forest	% of Forest Cover
1	2B/C2 Cachar Semi Evergreen Forest	27.47
2	2B/2S1 Pioneer Euphorbiaceous Scrub	0.01
3	2/2S1 Secondary Moist Bamboo Brakes	7.55
4	3C/C1b(ii) East Himalayan Lower Bhabar Sal	2.57
5	3C/C3b East Himalayan Moist Mixed Deciduous Forest	39.89
6	Plantation / TOF	22.51

2.4.2 Biodiversity – Tripura State

Tripura is very rich in biodiversity. Major type of forest in Tripura is tropical type, which is grouped as:

- Evergreen forest
- Moist deciduous
- Seral Type
- Subsidiary edaphic type

2.4.2.1 Biodiversity Index

The State belongs to two forest type groups, viz. Tropical Semi Evergreen and Tropical Moist Deciduous Forests. As per the rapid assessment of Biodiversity carried out by Forest Survey of India (FSI) at the national level for natural forests during September 2018 to May 2019 as part of the forest type mapping exercise in respect of Tripura, total number of species reported in the state are 148, out of which 89 are tree species, 37 are shrub species and 22 are herb species. The Shannon-Wiener Index of Tree, Shrub and Herb species in different Type Groups of the state are given below in **Table 2.14**.

Table 2-14: Shannon-Wiener Index of Tree, Shrub and Herb species in different Type Groups of Tripura

Sr. No.	Forest Type Group	Shannon – Wiener Index		
		Tree	Shrub	Herb
1	Group 2 - Tropical Semi Evergreen and	2.77	1.69	3.47
2	Group 3 - Tropical Moist Deciduous Forests	3.14	2.95	2.97

2.4.2.2 Flora of Tripura State²⁸

Tripura is a landlocked small hilly state of NER of India and part of richest reservoir of biodiversity. Aggressive civilization, rapid growth of industrialization and pollution results loss of different species from the earth causes danger to biodiversity. Different tribes of Tripura still

²⁷ Champion & Seth Classification system (1968), GoT, Tripura Forest Department

²⁸ biodiversity.tripura.gov.in and Source: Deb (1968, 1975)

live on and near forest and depend on local flora and fauna for the food, shelter, medication and ritual ceremonies. Environmental hazards and destruction of forest resulted permanent loss of different flora and fauna for the earth. This also causes great changes in the lives of tribal people of the state. Now this is appropriate time of demand to ensure the biodiversity and conserve it to protect the traditional life of tribal people and the world environment.

It is aimed at commissioning studies and sponsoring investigations and research for inventorization of the biodiversity in the state including dissemination of information and data across. It is also engaged in awareness creation through mass media regarding conservation of biological bio-diversity, sustainable use of its components and fair and equitable sharing of benefits arising out of the use of biological resource and knowledge. Taking steps to build up database and to create information and documentation system for biological resources and associated traditional knowledge through bio-diversity registers and electronics data bases, to ensure effective management, promotion and sustainable uses. The details of flora of Tripura are as follows:

Table 2-15: Highlights of flora of Tripura²⁹

No.	Group of Plant	Families	Genera
1.	Angiosperms	168	816
2.	Gymnosperms	6	8
3.	Pteridophytes	18	38
4.	Total	192	862

Various extension programmes towards biodiversity conservation education by involving schools and colleges; about 900 Eco-clubs across the state; setting up 'Biodiversity Libraries' in village schools; dissemination of posters, booklets, information bulletins etc.; setting up (proposed) exhibits in the Tripura State Museum and Science Academy for display of Biodiversity; observance of International Biodiversity Day, Wildlife Week, Environment Day, conducting and participating at National and State level seminars and workshops in collaboration with organizations/bodies like ONGC, Tripura University (Dept of Botany, Dept. of Forestry & Biodiversity), Trishna Wildlife Sanctuary (Tripura), Eco Clubs in schools, protected areas and BMCs across the State.

a. Some rare and endangered flora of Tripura:

Table 2-16: Rare and endangered flora

Sr. No.	Name of the Species	Family	Distribution
1.	<i>Begonia surculigera</i>	Begoniaceae	Unakoti
2.	<i>Colona flagrocarpa</i>	Tiliaceae	Sakhan, Tlangsang
3.	<i>Ophiorrhiza villosa</i>	Rubiaceae	Kumarghat, sipaijala
4.	<i>Torenia mucronulata</i>	Scrophulariaceae	Ghorakappa
5.	<i>Tournefortia roxburghii</i>	Scrophulariaceae	Sabroom
6.	<i>Jasminum listeri</i>	Oleaceae	Jampui ranges
7.	<i>Wallichia caryotoides</i>	Areaceae	Baramura and Atharamura ranges
8.	<i>Cycas pectinata</i>	Cycadaceae	Baramura range
9.	<i>Podocarpus neriifolius</i>	Podocarpaceae	Lalijuri
10.	<i>Gnetum montanum</i>	Gnetaceae	Teliamura

²⁹ Deb, 1981 & 1985

Sr. No.	Name of the Species	Family	Distribution
11.	<i>Gnetum oblongum</i>	Gnetaceae	Silachari
12.	<i>Mangifera sylvatica</i>	Anacardiaceae	Telimura and Ambasha
13.	<i>Dischidia benghalensis</i>	Asclepiadaceae	Tripura
14.	<i>Dischidia nummularia</i>	Asclepiadaceae	Tripura
15.	<i>Dischidia major</i>	Asclepiadaceae	Tripura

b. Some plants of economical use in Tripura:

Table 2-17: Economically important plants

Sr. No.	Scientific Name	Common Name
1.	<i>Albizzia lucida</i>	Silkoroi
2.	<i>Albizzia procera</i>	Safed Siris
3.	<i>Artocarpus chaplasi</i>	Sam
4.	<i>Carrya arborea</i>	Kumbhi
5.	<i>Chukmsia velutina</i>	Bogapoma
6.	<i>Cinnamomum bejolghata</i>	Tejpata
7.	<i>Dillenia indica</i>	Chalita
8.	<i>Dillenia pentagyna</i>	Akshi
9.	<i>Dipterocarpus turbinatus</i>	Kherjong
10.	<i>Duanbanga gradiflora</i>	Kokam
11.	<i>Gmelina arborea</i>	Gomari
12.	<i>Lagerstroemia parsiflora</i>	Sida
13.	<i>Lagerstroemia speciosa</i>	Ajur
14.	<i>Magnolia pterocarpa</i>	Thouthua
15.	<i>Mesua ferrea</i>	Nahor
16.	<i>Michelia champaca</i>	Titasopa
17.	<i>Palaquium polyantha</i>	-
18.	<i>Shorea robusta</i>	Sal
19.	<i>Sterospermum personatum</i>	Parolli
20.	<i>Syzygium cuminis</i>	Zamun
21.	<i>Terminalia alata</i> var. <i>tomentosa</i>	Asan
22.	<i>Terminalia bellirica</i>	Bairah
23.	<i>Terminalia myriocarpa</i>	Hollock
24.	<i>Toona ciliata</i>	-

Table 2-18: Economically important plants – Bamboo and Cane Species

Sr. No.	Scientific Name	Local Name
A.	Bamboo Species	
1.	<i>Bambusa affinis</i>	Kanak-Kai
2.	<i>Bambusa nutans</i>	Kali bans
3.	<i>Bambusa palida</i>	Makal
4.	<i>Bambusa polymorpha</i>	Bari
5.	<i>Bambusa teris</i>	Purua
6.	<i>Bambusa</i> spp.	Jai/ Purua/ Bombans
7.	<i>Dendrocalamus hamiltoni</i>	Ponch bans
8.	<i>Oxylanthum albouliata</i>	Kalai
9.	<i>Nedhoozca dulloa</i>	Dolu
10.	<i>Melocana bambusoides</i>	Mul
B.	Cane Species	

Sr. No.	Scientific Name	Local Name
1.	<i>Calamus erectus</i>	NA
2.	<i>Calamus floribundus</i>	NA
3.	<i>Calamus garbna</i>	Sundibet
4.	<i>Calamus teotopathoides</i>	NA
5.	<i>Calamus viminalis</i>	Pannabet
6.	<i>Calamus tenuis</i>	Chachibet

c. Important medicinal plants of Tripura:

Table 2-19: Medicinal plants

Sr. No.	Scientific Name	Family
1.	<i>Andrographis paniculata</i>	Acanthaceae
2.	<i>Aquillaria malaceensis</i>	Thymelaeaceae
3.	<i>Asparagus reticulatus</i>	Liliaceae
4.	<i>Baeopa moniari</i>	Scrophalariaceae
5.	<i>Centella asiatica</i>	Umbelliferae
6.	<i>Hemidesmus indicus</i>	Apocynaceae
7.	<i>Holorrhea pubescens</i>	Apocynaceae
8.	<i>Hydrocarpus kurzi</i>	Labiatae
9.	<i>Justica adhatida</i>	Acanthaceae
10.	<i>Marsilea minuta</i>	Acanthaceae
11.	<i>Ocimum tenuifloram</i>	Labiatae
12.	<i>Phlogacanthus thyrsoiflorus</i>	Acanthaceae
13.	<i>Rawlfia serpentina</i>	Apocynaceae
14.	<i>Saraca asoca</i>	Fabaceae
15.	<i>Terminalia belerica</i>	Combretaceae
16.	<i>Terminalia chebula</i>	Combretaceae
17.	<i>Vitex negabdo</i>	Verbenaceae
18.	<i>Vitex peduncularis</i>	Verbenaceae

d. Most common Families of Agri-horticultural Species:

Table 2-20: Agri-Horticultural Plants

Sr. No.	Name of the Family	No. of Genera	No. of Species
1.	Papilionaceae	44	96 + var.
2.	Gramineae	49	79 + 1 var.
3.	Compositae	39	54
4.	Solanaceae	11	26 + 1 var.
5.	Cucurbitaceae	16	26 + 1 var.
6.	Malvaceae	10	25 + 1 var.
7.	Aracear	15	25 + 1 var.

Two-thirds of the state is forested where different species of trees, orchids, birds and wildlife are found. There are four sanctuaries in the state namely, Rowa wildlife sanctuary, Sepahijala wildlife sanctuary, Trishna wildlife sanctuary and Gumti wildlife sanctuary.

The Sepahijala Wildlife Sanctuary in Tripura has 456 plant species of monocotyledon and dicotyledonous plants. Trees of Sal, Chamal, Garjan and Kanak exist predominantly. The secondary species consist of Pichla, Kurcha, Awla, Bahera, Hargaja, Amlaki, Bamboos and

grasses. There are 5 species of primates in this sanctuary. The crab eating Mongoose, which was last sighted before 72 years ago in India has been discovered again in this sanctuary. There are about 150 species of birds in this sanctuary. During winter a large number of migratory birds visit the sanctuary. There are more than 150 species of residential birds and migratory birds are found here. This sanctuary is also a beautiful picnic spot.

2.4.2.3 Invasive Species of Tripura State³⁰

An invasive plant is a non-native plant that is able to persist and proliferate outside of cultivation, resulting in ecological and/or economic harm. Once established in these areas, invasive plants often continue to spread to adjacent habitats. All invasive plant species are aggressive competitors with the ability to significantly reduce diversity of native plant and also disturb & alter wildlife habitat. As per ISFR, 2019, there are five invasive species in Tripura, *Chromolaena odorata*, *Mikania micrantha*, *Imperata cylindrica*, *Saccharum spontaneum* and *Lantana camara*.

As per literature review, it is observed that invasive plants spread by a variety of mechanisms, including birds, wind, and water. Human activities are also a major factor in the spread of these plants, from gardening, medicinal uses, edible properties and transport of nursery stock to erosion control and wildlife plantings.

Table 2-21: Invasive species recorded from Project Area and uses

Species Name	Common Name	Medicinal Uses
Chromolaena odorata	Siam weed / Bagh	Used wound skin, skin infections, inflammation, a therapeutic agent for a variety of diseases, such as wound healing, anti-inflammatory, analgesic, antipyretic, diuretic, and antimicrobial, anti-mycobacterial
Mikania micrantha	RAVANLATA / bitter vine	A poultice made from the leaves of M. micrantha is used to treat venomous biting of insects and the leaf juice is used to reduce skin rashes and itches. furthermore, it is used to mitigate stomach ache, jaundice, fever, rheumatism, cold, and respiratory diseases
Imperata cylindrica	Darbha / cogongrass	They are decocted and used to treat urinary tract infections, fevers, thirst etc. The root is astringent, antifebrile, antivenoms, diuretic, emollient, hemostatic, restorative and tonic. It is used in the treatment of nose bleeds, hematuria, hematemesis, oedema and jaundice
Saccharum spontaneum	wild sugarcane/ Kans grass	According to Ayurveda, roots are sweet, astringent, emollient, refrigerant, diuretic, lithotriptic, purgative, tonic, aphrodisiac and useful in treatment of dyspepsia, burning sensation, piles, sexual weakness, gynecological troubles, respiratory troubles
Lantana camara	Raimuniya / Wild sage	The plant extracts have been used in folk medicine for the treatment of cancers, chicken pox, measles, asthma, ulcers, swellings, eczema, tumors, high blood pressure, bilious fevers, catarrhal infections, tetanus, rheumatism and malaria

2.4.2.4 Faunal Diversity of Tripura:

Mammalian Fauna:

The faunal diversity of the State can be viewed from Aquatic and Terrestrial ecosystems. In the aquatic system, at least 129 species of fishes are recorded belonging to 32 families, and 11 order, the largest number of species being from the family Cyprinidae (49 species, including Rohu, Katla, Kalbasu, Puthi, Mahasheer, Chela, etc.). The invertebrate fauna includes 27 species of Protozoans, 30

³⁰ ISFR, 2019

species of Crustaceans, 10 species of Rotifers, two species of annelids, 14 species of insects (water beetles, bugs, Odonates, mosquitoes, etc.) and six species of Mollusca.

Mammalian fauna was reported to be composed 54 species. These represent more than 33% of the total mammalian fauna known from India. Of the 15 primate species known from India 7 species have been recorded from Tripura of which Phayre's Leaf Monkey (locally known as "Chashma Banar") is the most dominant species. Endangered species of primates, besides Leaf Monkey include Slow Loris, Stumped-tail Macaque, Pigtail Macaque and the only tail less ape, Hollock Gibbon. Some of the mammalian species like common Tree Shrew, Indian Bison, Chinese Pangolin is reported to be very rare, while the population of Hoolock Gibbon, Indian Elephant and Jackal are reported to be declining.

Avian Fauna:

The avian fauna is composed of 341 species belonging to 51 families of which 77 species are winter visitors. It may be noted that Tripura with only 0.4 percent of the total geographical area of India exhibits more than 25% of the avian species diversity of the country. Of the avian species 4 species belong to Schedule I and 271 species belong to Schedule IV of the Indian Wildlife (Protection) Act, 1972, Amended till date.

Reptilian Fauna:

The reptilian fauna of Tripura is composed of 32 species under 28 genera and 11 families. These include 3 species of turtles and tortoise, 13 species of lizards, and 15 species of snakes.

Table 2-22: Rare and Threatened Fauna of Tripura

Sr. No.	Common Name	Scientific Name	Schedule-I WL(P) Act	Appendix-I CITES
1.	Slow Loris	<i>Nycticebus coucang</i>	+	-
2.	Phayre's Leaf Monkey	<i>Presbytis phayrei</i>	+	-
3.	Capped Langur	<i>Presbytis pileatus</i>	+	+
4.	Hoolock Gibbon	<i>Hylobates hoolock</i>	+	+
5.	Leopard	<i>Panthera pardus</i>	+	+
6.	Marbled Cat	<i>Felis marmorata</i>	+	+
7.	Leopard Cat	<i>Felis bengalensis</i>	+	+
8.	Golden Cat	<i>Felis temmincki</i>	+	+
9.	Common Otter	<i>Lutra lutra</i>	-	+
10.	Indian Elephant	<i>Elephas maximus</i>	+	+
11.	Indian Bison	<i>Bos gaurus</i>	-	+
12.	Chinese Pangolin	<i>Manis pentadactyla</i>	+	-

Problems relating to Biodiversity Conservation

- **Habitat Destruction:** Change of land use due to conversion of forest for non-forestry purposes specially to meet the demand of plantation crops and development activities cause serious concern for and degradation of wildlife habitat. No quantified data is available on annual or decadal basis for such conversion activities.
- **Grazing:** There is no pasture land in the state for livestock grazing. It is estimated that 60% of the livestock graze in the forest land. This far exceeds the carrying capacity of the forests and causes destruction of young growth of the forest and destruction of habitat for the wild animals.
- **Forest Fires:** Forest fires are common and frequent in the state. It is now estimated that forest fire is common in 20 percent of the total forest area of Tripura. The major causes may be intentional burning of ground cover for grazing or for jhum cultivation. This led to complete wiping out the forest regeneration in some areas, (natural as well as artificial) and wildlife is severely damaged.

- **Shifting Cultivation:** The slash and burn cultivation in the hill tribal areas has direct impact on biodiversity viz. destruction of wildlife and natural habitat, loss of natural forest and loss of ecological balance including destruction of feeding, breeding and roosting grounds.
- **Introduction of Exotic Species:** Due to change in agricultural practices and emphasis in food security a number of plant species have been introduced in Tripura. It is estimated that 280 species of plant have been introduced in the state during the past period. The impact of such introduction has never been assessed but it may be assumed that in number of local indigenous varieties have become rare or have disappeared due to introduction of exotics.
- **Illegal Hunting:** The conservation of biodiversity depends on strict protective measures in the field condition besides, appropriate legal instrument. Due to disturbed geopolitical condition, it is apprehended that illegal hunting pressure has increased in many remote and isolated dense forest areas. In absence of lack of appropriate monitoring and surveillance mechanism, the human pressure on wildlife may continue to increase.

2.4.3 Floristics – Project Districts

2.4.3.1 Forest Cover

Total forest cover in the project districts i.e., Dhalai, North Tripura and Unakoti Districts is 3087 sq km, which is 68 % of the project district's geographical area. Please refer **Table 2.23**. In terms of forest canopy density classes, the project districts have 490 sq km under VDF, 2725 sq km under MDF and 4268 sq km under OF. The details of forest cover of subproject districts are given below in **Table 2.24** and **Map 2-22 to 2-24**. Details of forest involvement in different lines of instant project are presented below in **Table 2.25**:

Table 2-23: Forest Area Classification – Project Districts³¹

District	Geographical area of Project District Sq. Km	Forest area Sq. Km					% Total of District GA
		RF	PRF	UCF	PF	Total	
Dhalai	2400	1092	44	723	1	1860	77.5
North Tripura	1422.19	477	66	354	0.01	897	63.1
Unakoti	687.79	162	87	81	0	330	48
Total	4510	1731	197	1158	1.01	3087	68

Table 2-24: Forest Canopy Density Classification – Project Districts³²

District	Geographical area of Project District Sq. Km	2019 Assessment Forest area Sq. Km					% Total of District GA
		VDF	MDF	OF	Total		
Dhalai	2400.00	116	1466	402	1984	83	
North Tripura and Unakoti	2109.98	50	1053	377	1480	70	
Total	4510	166	2519	778	3464	77	

The forest involvement as per IEAR was 15.7 ha. in Kailasahar- Dharmanagar 132 KV D/C TL. It is reduced to 14.36 Ha as a result to meticulous planning. Also, earlier there was no forest was involved in 132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar DL. Due to diversion of line route for NH expansion some forest stretches were unavoidable in DL. The total Forest involvement in TL and DL S/S is now 15.36 Ha. Details of forest involvement in different lines are presented below in **Table 2.25**.

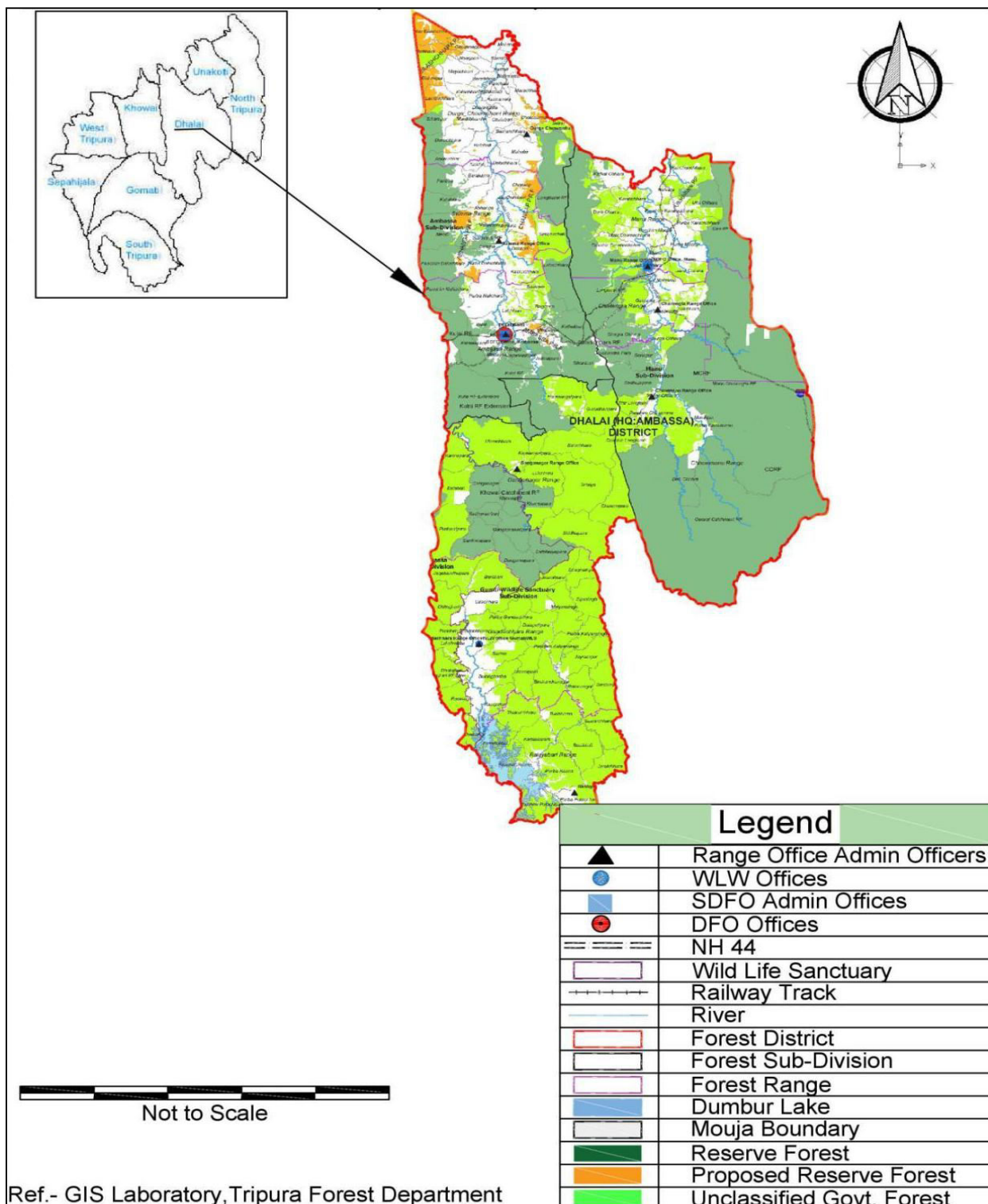
³¹ (Source: <http://trpervis.nic.in/test/forest.html>)

³² India State of Forest Report (ISFR), 2019

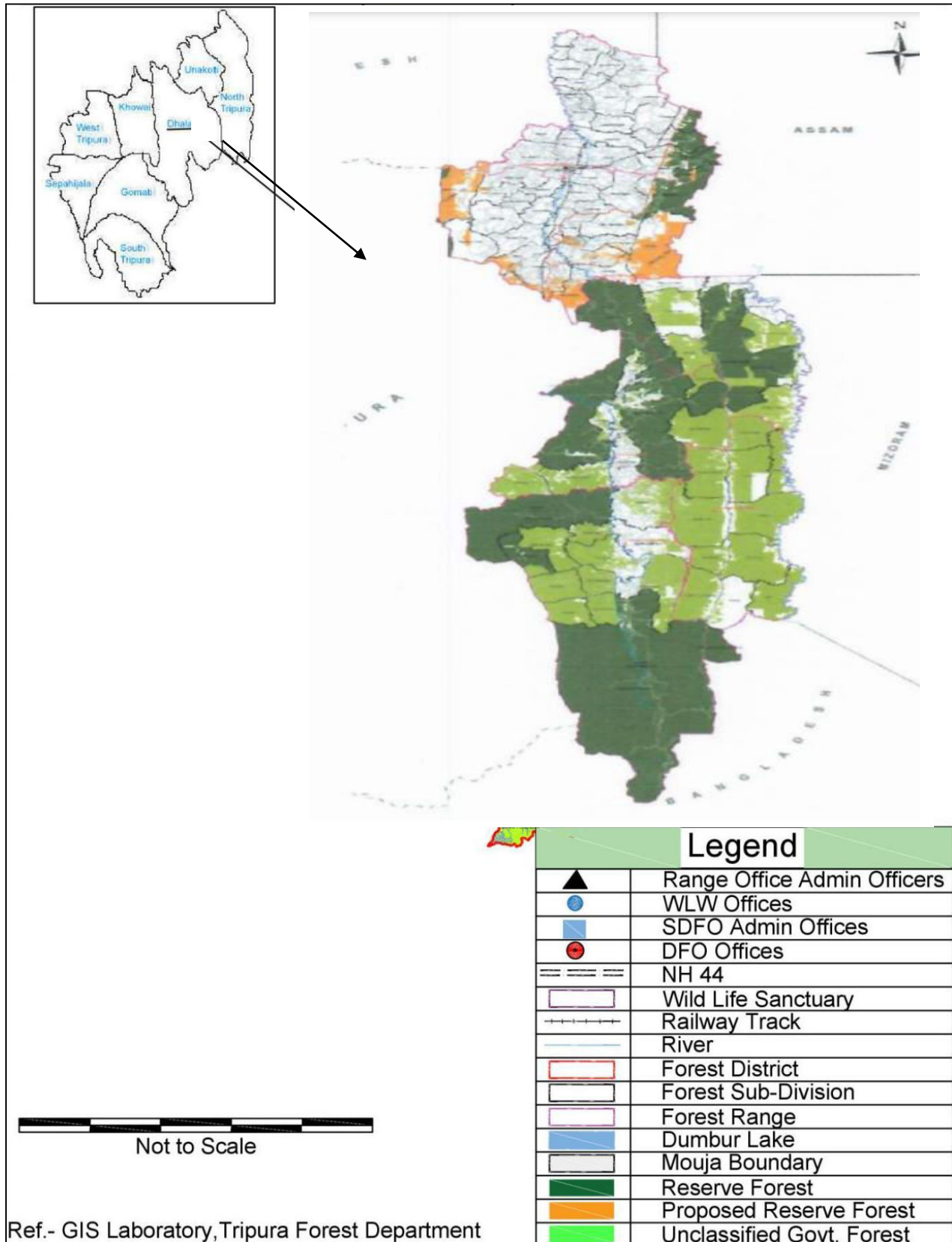
Table 2-25: Forest Area involvement in Project Lines

Sr. No.	Name of Transmission Line	Forest Involvement (In ha.)
1	Kailasahar- Dharmanagar 132 KV D/C line	14.3586
2	132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New)	0.9972
Total		15.3558

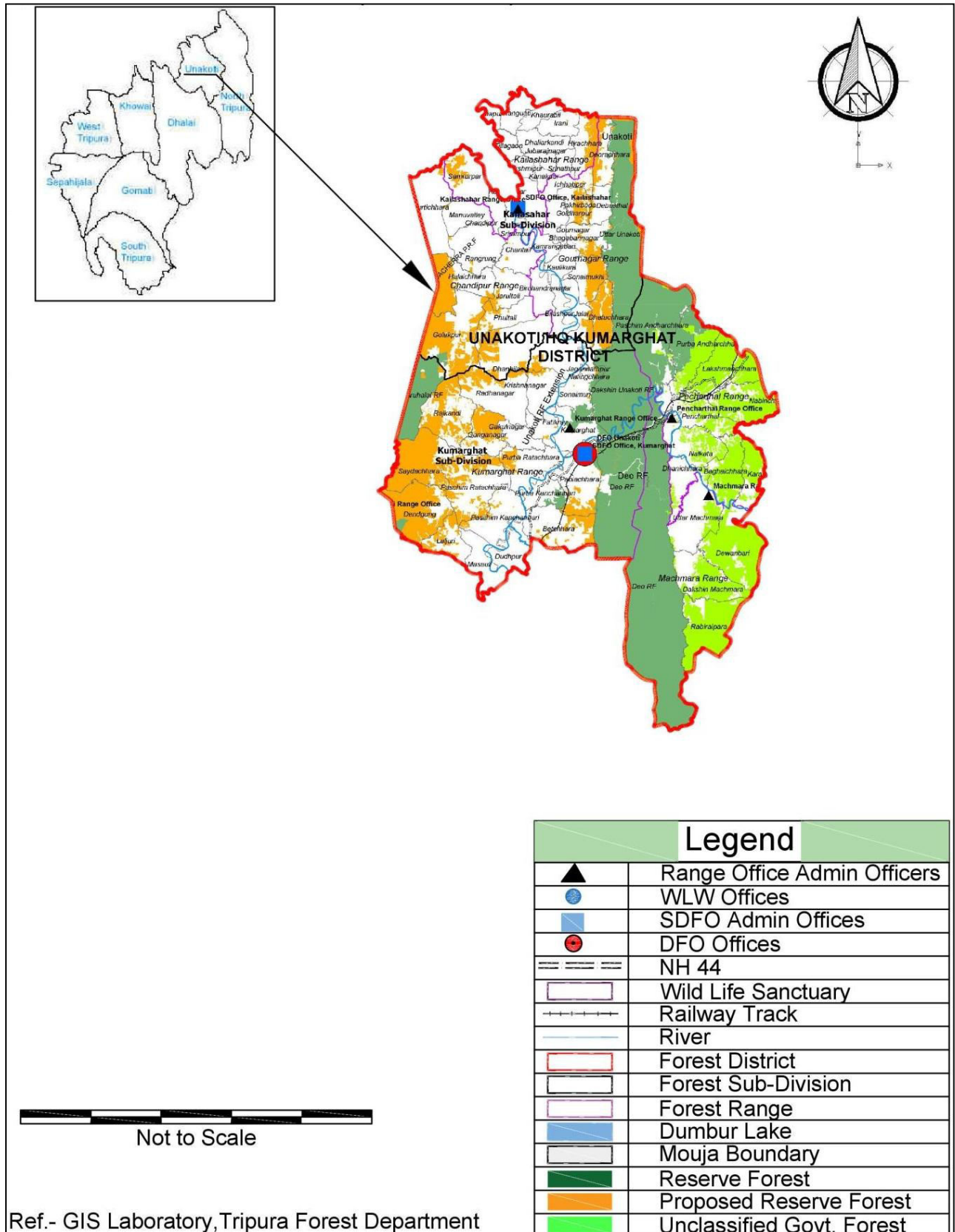
Map 2-22: Forest Classification Map - Dhalai District



Map 2-23: Forest Classification Map – North Tripura District



Map 2-24: Forest Classification Map - Unakoti District



2.4.4 Study Area Baseline Data Collection

The study area for the floristic surveys has already been defined in the Chapter 1 which is defined as area in the proximity of the proposed TLs on both left and right sides, corridors of TL routes and S/S. The description of the vegetation is based upon these observations and data collected around each site collected through transects as already mentioned above.

In general, the vegetation in and areas around sampling sites is comprised of tropical wet evergreen and moist deciduous floral elements. Therefore, field surveys for the assessment and composition of vegetation were conducted to assess the floral wealth in the proximity to the towers, S/S and along the routes of TL.

A series of transects were identified along the routes of TL covering the corridors between the ROW of TL and s/s. The basis of data collection is along the route of the TL considering a RoW of 27 mts for 132 kV line. For homogenous stretches / sections of the route like along paddy field, along tea garden etc. data collection is carried out section wise. During the surveys, 30 to 60 % of total route length was covered to collect baseline data, because entire route is not accessible at present. As regard substation, the whole substation area was covered. Details of transects locations selected for phytosociological survey are as given in **Table 2.26**.

Table 2-26: Transmission Lines and Transects Locations for Vegetation Sampling

Sr. No.	Name of Line and Locations of samplings	Stretch Covered and No. of Poles	Section Length	% Covered for Line Survey
1	Kailasahar- Dharmanagar 132 kV D/C line – 21.916 Km	Gantry TO AP-1/0 AP-1/0 TO AP-2/0 AP-3/0 TO AP-4/0 AP-4/0 TO AP-5/0 AP-5/0 to AP – 9/0 Ap-9/0 to AP-12/0 AP-15 to AP-16 AP-29 to AP-31	8 km	36%
2	LILO of 132kV Ambassa - PK Bari line at Manu S/S – 1.175 Km	Ext 231 to AP1B/0 AP-1/0 to Ap-3/0	0.5 km	55%
3	132 KV Interconnection from old Manu S/S to New Manu S/s at Chauwa Manu for charging at 132 KV S/C Manu to Chawmanu – 3.310 km	AP-1 to AP-5 AP-6 to AP-8 AP-10 to AP-13	0.6 km	65%

2.4.4.1 Taxonomic Diversity

Based upon the data collected during field surveys and data / information collected from secondary sources inventory of 77 plant species found in the area surveyed was prepared. Conservation status of plant species found in the study area was assessed using IUCN Red list of Threatened Species Version 2020.1 (accessed in 2021) as well as Red Data Book of Indian Plants by BSI. The list is well given in **Appendix A under Heading D with IUCN Status**.

Dominant species recorded in the project area are *Hevea brasiliensis*, *Syzigium Cumini*, *Pterospermum Acerifolia*, *Tectona grandis*, *Schima Wallichii Chois*, *Bombax Ceiba*, *Gmelina Arborea*, *Albizia lebbeck*, *Syzigium Cumini*, *Artocarpus Heterophyllus*, *Zizyphus Jujuba*, *Mangifera indica*, *Pterocarpus marsupium*, *Terminalia bellarica*, *Aegal marmelos*. Amongst these only *Aegle marmelos* is recorded in the study area which is near threatened species as per Conservation Status IUCN (2020.1). *Lantana Camera* is invasive species recorded during filed survey.

2.4.4.2 Invasive Species and Their Control

During field survey *Lantana camara* invasive species is recorded in the study area i.e., transects studied along the different TLs, their routes and S/S. Considered as one of the most invasive weeds. *L. camara* is distributed as an ornamental plant throughout the world since the 17th century, the *lantana* is one of 100 species of the most invasive of the IUCN list. The presence of invasive plant species is indicative of degradation of vegetation.

The newly disturbed ground is prime habitat for more invasive species to colonize. A protective approach is required for eliminating or control the spread and establishment of invasive plants species, for which there are two key elements. First, project authorities would ensure to uproot all existing alien/invasive species from the labor colony and other working areas. Secondly, project workers are discouraged to plant any alien and/or invasive species in the camp and colony areas, which may spread in the forest areas.

Eliminating the invasive species by uprooting or pulling is laborious but may be the best choice for on steep or rough terrain. Replanting the area immediately with a desirable selection of native plants is necessary. There must be an emphasis on early detection and eradication of these invasive species populations in the area especially the new population. To control and check the growth of invasive species, plantation of indigenous species in the area occupied by invasive species is also necessary. The other factor that helps in control of non-indigenous species is the increase of knowledge and awareness among the workers and villagers. In the present project, none of the project activity contribute in the growth of any invasive species.

2.4.4.3 Vegetation Profile of the Sampling Area

Site 1: Kailasahar- Dharmanagar 132 kV D/C line – 21.916 Km

For vegetation profile study approximately 8 km of stretch i.e., 36% of total TL length is covered. The vegetation, in general, in area around **Kailasahar- Dharmanagar 132 kV DC TL** is comprised of secondary vegetation with trees like *Tectona grandis*, *Ficus racemose*, *Aegle marmelos*, *Ficus religiosa*, *Delonix regia*, *Bambusa vulgaris*, *Hevea Brasiliensis*, *Acacia nilotica*, *Terminalia arjuna*, *Cocos nucifera*, *Areca catechu*, *Artocarpus heterophyllus*, *Cinnamomum glanduliferum*, *Terminalia bellirica* and *Bombax ceiba*. **Detailed List is depicted in Appendix A under Heading D.**

The area along the RoW of **Kailasahar- Dharmanagar 132 kV DC TL** is mainly under Reserved Forest comprising of Open Hill Forest and Rubber plantation and rest agriculture land. In agriculture area majorly paddy fields are observed, Vegetation also comprised of fruit bearing trees like *Mangifera indica*, *Artocarpus heterophyllus*, *Prunus domestica*, *Manilkara zapota*, *Litchi chinensis*, *Tamarindus indica* along with *Lantana*, *Jasminum*, etc.

Amongst economically important trees *Areca catechu*, *Artocarpus heterophyllus*, *Cinnamomum glanduliferum*, *Terminalia bellirica*, *Bombax ceiba*, *Tectona grandis*, *Ficus racemose*, *Aegle marmelos*, *Ficus religiosa*, *Delonix regia*, *Bambusa vulgaris*, *Hevea Brasiliensis*, *Acacia nilotica*, *Terminalia arjuna*, *Cocos nucifera* are recorded. Teak plantation and Rubber plantation recorded along the TL route is mainly under forest department.

Site 2: LILO of 132kV Ambassa - PK Bari line at Manu S/S - 1.175 Km

For vegetation profile study approximately 0.5 km of stretch i.e., 43 % of total TL length is covered. The vegetation, in general, in area around **Ambassa - PK Bari line 132 kV DC TL** is comprised of secondary vegetation with trees like *Tectona grandis* and *Hevea Brasiliensis*. The area along the RoW of **Ambassa - PK Bari line 132 kV DC TL** is mainly under Rubber plantation. **Detailed List is depicted in Appendix A under Heading D.**

Site 3: 132 KV Interconnect old Manu S/S to New Manu S/s at Chauwa Manu for charging at 132 KV S/C Manu to Chawmanu - 3.310 km

For vegetation profile study approximately 0.6 km of stretch i.e., 18% of total TL length is covered. The vegetation, in general, in area around **old Manu S/S to New Manu S/s 132 kV DC TL** is comprised of secondary vegetation with trees like *Tectona grandis*, *Areca Catachu*, *Hevea Brasiliensis*, *Bambusa vulgaris*, *Artocarpus heterophyllus*. **Detailed List is depicted in Appendix A under Heading D.**

The area along the RoW of **old Manu S/S to New Manu S/s 132 kV DC TL** is mainly under Agriculture and Rubber plantation. In agriculture area majorly paddy fields are observed, Vegetation also comprised of fruit bearing trees like *Mangifera indica*, *Artocarpus heterophyllus*, *Litchi chinensis* etc.

Amongst economically important trees *Areca catechu*, *Artocarpus heterophyllus*, *Tectona grandis*, *Ficus racemose*, *Aegle marmelos*, *Bambusa vulgaris*, *Hevea Brasiliensis*, *Acacia nilotica* are recorded. Teak plantation and Rubber plantation recorded along the TL route is mainly under forest department.

2.4.4.4 Faunal Elements

Faunal elements of the study area, were studied during floral survey / vegetation profile study of the project ROW. During the field surveys, no species encountered. However, during interaction with local people, fauna species generally found in the project area, are recorded. It is also noted that the number of mammal's species is decreasing gradually in the area and they are occasionally seen. Following faunal elements are recorded in the study area based on information from local people and secondary data.

Table 2-27: Fauna Recorded in Project Area

No.	Common Name	Scientific Name	Conservation Status IUCN (2020.1)
1.	Barking deer	Muntiacus muntjak	Least concern
2.	Turdoides striata	Jungle babbler	Least concern
3.	Striped Tit Babbler	Mixornis gularis	Least concern
4.	White hooded babbler	Gampsorhynchus rufulus	Least concern
5.	Barn Swallow	Hirundo rustica	Least concern
6.	Yellow eyed babbler	Chrysomma sinense	Least concern
7.	Great myna	Acridotheres grandis	Least concern
8.	Black throated thrush	Turdus atrogularis	Least concern
9.	Little Pied Flycatcher	Ficedula westermanni	Least concern
10.	Flower peckers	D. erythrorhynchos	Not evaluated
11.	Black Cross-barred Kukri Snake	Oligodon cinereus	Least concern

No.	Common Name	Scientific Name	Conservation Status IUCN (2020.1)
12.	Indus Valley Toad	Duttaphrynus stomaticus	Least concern
13.	Asian Common Toad	Duttaphrynus melanosticus	Least concern
14.	Fulvous Whistling Duck	Dendrocygna bicolor	Least concern
15.	Lesser Whistling Duck	Dendrocygna javanica	Least concern
16.	Common Teal	Anas crecca	Least concern
17.	Indian Peafowl	Pavo cristatus	Least concern
18.	Rain Quail	Coturnix coromandelica	Least concern
19.	Red Junglefowl	Gallus gallus	Least concern
20.	Crow	Corvus culminates	Least concern
21.	Sparrow	Passer Sp.	Least concern
22.	Fox	Vulpes benghalensis	Least concern
23.	Monkey	Phayre's leaf monkey	Least concern

2.4.5 Protected Areas (PA) – Tripura State:

Tripura has two National Parks (NP) and four Wildlife Sanctuaries (WLS) covering an area of 603.64 square km constituting 5.75% of the total geographical area of the State. There is no notified elephant reserve/ corridor found in Tripura. Map of PA of Tripura State is shown in **Map 2-24**.

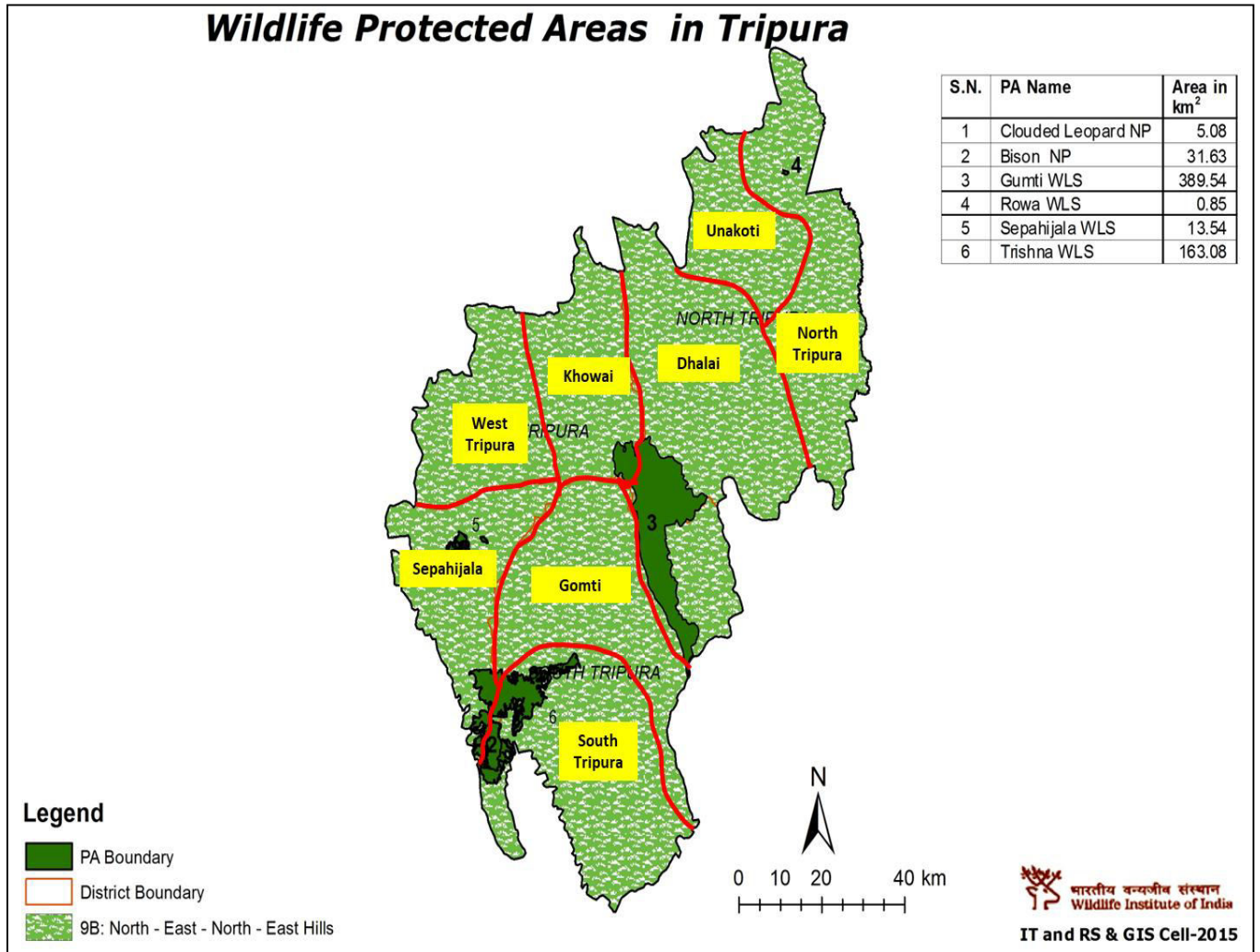
Table 2-28: PA of Tripura State

Sr. No.	Name of the PA (WLS /NP)	Area in Sq. Km	Location/ District	Important Flora and Fauna found
1.	Sepahijala WLS	18.54	Sepahijala	Birds and Primates, Migratory Birds in the winter, Spectacled Monkey.
2.	Gomati WLS	389.54	Dhalai, Gomati	Elephant, Samber, Barking Deer, Wild Goats, Serrow etc.
3.	Trishna WLS	194.71	South Tripura	Birds and Primates, Bison, Leopard, Barking Deer, Wild Dog, Capped Langur, Spectacled Monkey, Slow Lorries, etc.
4.	Rowa WLS	0.86	North Tripura	Many species of Birds and Primates
5.	Bison (Rajbari) NP	31.63	South Tripura	Bisons and many species of Birds
6.	Clouded Leopard NP	5.08	West Tripura	Clouded Leopard, Spectacled Langur and many Birds

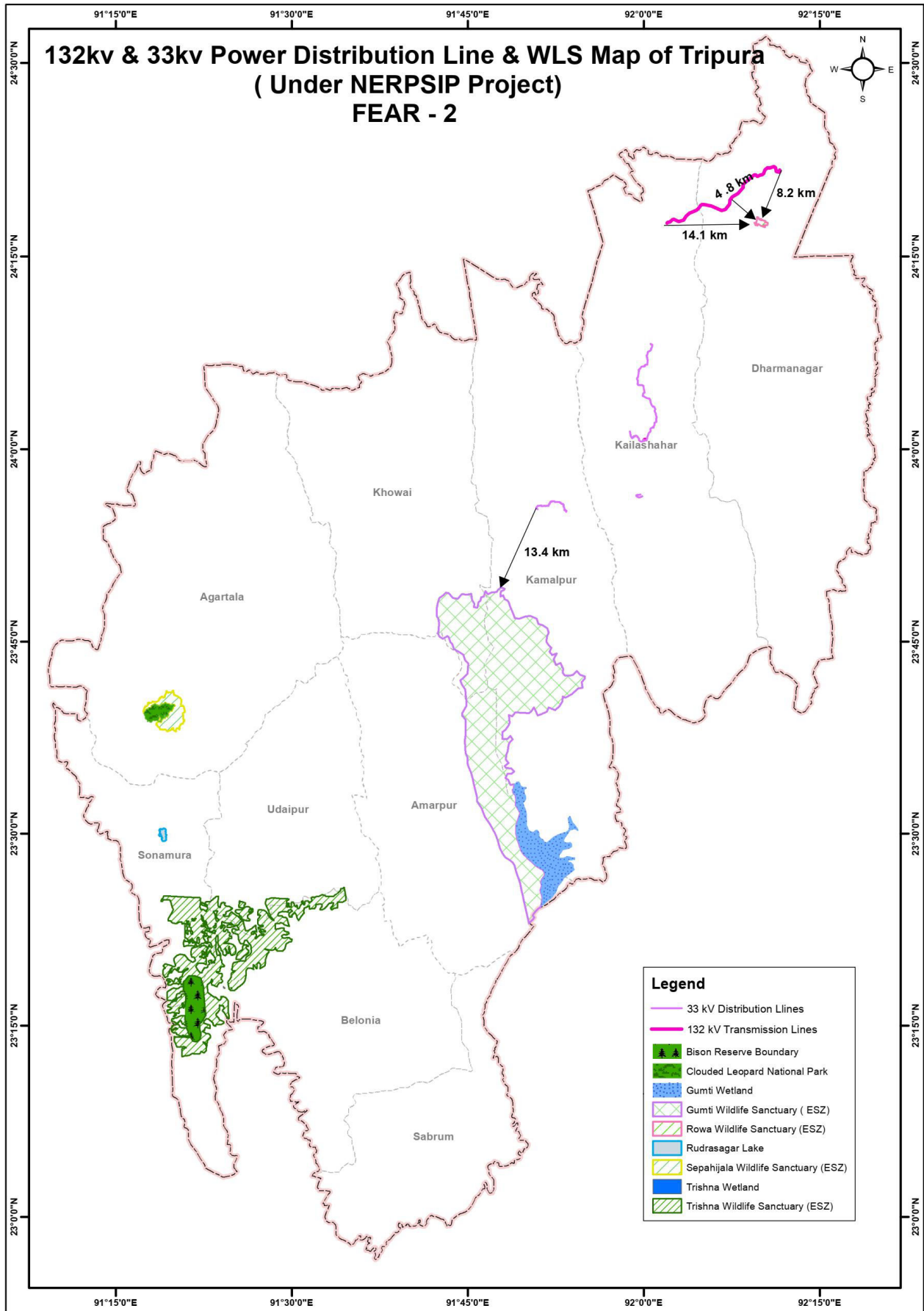
2.4.5.1 PA with respect to project districts:

The proposed TLs/DLs are not passing through any protected area like NP, WLS, IBAs, conservation reserves, community reserves and biosphere reserves, etc., as all such areas have been completely avoided through meticulous alternative alignment analysis and careful route selection. Kailasahar- Dharmanagar 132 kV D/C TL 132 kV D/C alignment is passing at a distance of 4.8 km away from the Rowa WLS boundary from its nearest point in respect of line route. The map is prepared using Wildlife Institute of India's geospatial map of area showing Rowa WLS boundary and line route is placed in **Annexure 3**. Other PAs are beyond 10km from project components. The consolidated Map of PA with respect to FEAR II Project is depicted as **Map 2.26**. No ecologically sensitive areas are getting adversely impacted due to project interventions because of TL and DL. IA has already obtained necessary forest and wildlife clearance as per regulatory provisions under Forest (Conservation) Act, 1980 and IA has the obligation to comply with conditions prescribed in the above clearances.

Map 2-25: Map of PA (Eco sensitive zones) of Tripura



Map 2-26: FEAR 2 – Subprojects and PAs



2.5 Socio Economic Environment

For sustainable development, it is important to understand social and economic conditions of the community in the region, impacts of development on the community, measures to mitigate negative impacts and enhance the positive impacts. For new development initiatives, socio economic assessment plays an important role to ensure community participation and their acceptance of the development activity. It also helps in planning the activities for local area development.

2.5.1 Human and Economic Development – Tripura State³³

Tripura is a hilly state in northeast India, bordered on 3 sides by Bangladesh, and home to a diverse mix of tribal cultures and religious groups. In the capital Agartala, the imposing Ujjayanta Palace is set among Mughal gardens, and Gedu Mia's Mosque has white marble domes and towers. South of the city, Neermahal summer palace sits in the middle of Lake Rudrasagar.

Tripura is an agrarian State with more than half of the population dependent on agriculture and allied activities. However, due to hilly terrain and forest cover, only 27 % of the land is available for cultivation. Rice, the major crop of the state, is cultivated in 91 % of the cropped area. According to the Directorate of Economics & Statistics, Government of Tripura, in 20018–19 along with rice cultivation other major cultivation are potato, sugarcane, pulses and jute. Jackfruit and pineapple top the list of horticultural products. Traditionally, most of the indigenous population practiced jhum method (a type of slash-and-burn) of cultivation. The number of people dependent on jhum has declined over the years.

Pisci culture has made significant advances in the State. At the end of 2018–19, the State produced a surplus of 104.3 million fish seeds. Rubber and tea are the important cash crops of the State. Tripura ranks second only to Kerala in the production of natural rubber in the country. The State is known for its handicraft, particularly hand-woven cotton fabric, wood carvings, and bamboo products. High quality timber including sal, garjan, teak and gamar are found abundantly in the forests of Tripura. The industrial sector of the State continues to be highly underdeveloped – brickfields and tea industry are the only two organized sectors. Tripura has considerable reservoirs of natural gas. According to estimates by Oil and Natural Gas Corporation (ONGC), the State has 400 billion cubic meter reserves of natural gas, with 16 billion cubic meters is recoverable. ONGC produced 480 million cubic meter natural gas in the State, in 2006–07. In 2011 and 2013, new large discoveries of natural gas were announced by ONGC.

The economy of Tripura can be characterized by rate of poverty, low capital formation inadequate infrastructure facilities, Geographical isolation and communication bottleneck, inadequate exploration and use of forest and mineral resources, slow industrialization and high unemployment. More than 50% of the population depends on agriculture for sustaining their livelihood. However, share of agriculture and allied activities in Gross State Domestic Production (GSDP) is only 23% primarily due to low capital base in the sector.

³³ Economic Review of Tripura, 2018-19, Directorate of Economics & Statistics, Planning (Statistics) Department, Government of Tripura, Agartala

2.5.2 Economic Development – Project Districts

2.5.2.1 Economy – Dhalai District:

Socio-economically it is most backward District of the state. In 2006 the Ministry of Panchayati Raj named Dhalai one of the country's 250 most backward districts (out of a total of 640). It is the only District of Tripura which receives grants from the Union Government under the Backward Regions Grant Fund (BRGF). An overwhelming 76% of the workers are dependent on agriculture for their livelihood. Practice of Jhum cultivation (shifting cultivation) still continues in many parts of the district by the tribals residing in the deeply forested hills. The fertile Valleys are mostly occupied by the non-tribals, mostly Bengalis and are the primary centers of economic activity in the district. 25% of the households in the district are classified as Below Poverty Line (BPL). The Strengths of the District are its huge natural resources, fertile land, conducive climate, adequate and well spread rainfall, high literacy rate & strategic location of the district being well connected by the National Highway (NH 44).

2.5.2.2 Economy – North Tripura District:

Economy of North Tripura is primarily based on Agriculture, animal resource development and fisheries. Mainly Paddy, Orange, Pine apple, Jack fruit, Banana, Lemon, Areca-nut, mango, etc are cultivated here. In this district fisheries are one of the main sources of income. Many small & medium scale fisheries are available in North Tripura district; which is providing job to many people. In North Tripura district, Tea Garden are also present; which also provides job to many people. Rubber plantation & Bamboo plantation is also another source of economy in North Tripura.

2.5.2.3 Economy – Unakoti District:

Unakoti, one of the eight districts of Tripura is situated in the northern border of the State. Presently about 8, 000 Darlongs belonging to Kukichin group are residing in 22 villages of Unakoti, North Tripura and Dhalai districts. Their population is even less than one per cent to total population of the State. Maximum concentration of this community is found in Unakoti District. Weaving is the primitive economic activity as well as cultural symbol of this tribal community. The research tries to find out the status of socio-cultural-economic life of the Darlongs in the rural sites of Unakoti District, Tripura through extensive field survey. Modernization plays a crucial role in the developmental process over social traits of the Darlong Community. The research additionally explores the challenges being faced by the community weaving mores. Acculturation of Darlong culture and that of modern western culture is transforming their own culture giving a new shape. It has been observed that large segments of the Darlong society who reside in the interior part of the hilly state have little scope of getting involved in the handloom activities. The socio-economic status of the Darlong has been changing rapidly because of educational improvement and cultural assimilation as a result which time-honored cultural element especially traditional dresses particularly of man gradually being replaced by modern western dress.

2.5.3 Demography – Tripura State³⁴

Tripura is the second most populous State in North Eastern Region after Assam. As per Census 2011 population was 36,73,917, out of which 18,74,376 males and 17,99,541 females. The data of Census-2011 shows that Tripura ranks 18th in terms of density of population at all India level. Among the north-eastern states, in terms of density, Tripura remained the second highest populous State after Assam. The population density of Tripura in 2011 was 350 persons per sq.km., which means that 45 more people live in a sq. km. area in the State then they lived a decade ago. The population density for all India in 2011 was 382. There is a positive improvement in sex ratio in the State as it rose from 945 (per 1000 males) in 1991 to 948 (per 1000 males) in 2001 and further to 960 in 2011. As per Census 2011, the literacy rate of Tripura was 87.22 %. The density of population is 350 persons / sq. km.

The people of the Scheduled Tribes (ST) comprise about one-third of the population. As per Census-2011, ST population of the State was 11,66,813 which is 31.75 % of the total population of the State. The total ST male was 5,88,327 and ST female was 5,78,486. The Census-2011 data shows that SC population of the State was 6,54,918 (17.8 %). The total SC male was 3,34,370 and SC female was 3,20,548.

The workforce data based on Census-2011 has been released by the Registrar General of India, New Delhi shows that the total number of workers (main & marginal) in the State was 14,69,521. Out of these total workers, 11,59,561 were the main workers and 3,09,960 were the marginal workers in 2011. The total male workers (main & marginal) were 10,45,326 and remaining 4,24,195 were the female workers in 2011. Out of the total worker (main & marginal), 11,16,076 (75.95 %) were in rural areas and 3,53,445 (24.05 %) were in the urban area in 2011, respectively. The proportion of total workers (main & marginal) in total population of the State was 39.99 in 2011, which was 36.24 percent in 2001. The total main workers were 10,77,019 in 2011, out of which 8,87,881 (83.44 %) were male main workers and 1,89,138 (17.56 %) were female main workers.

2.5.4 Demography – Project Districts

Population of the project districts Dhalai, North Tripura and Unakoti in Tripura as per 2011 census are as shown in **Table No. 2.29 through Table 2.31**.

³⁴ Census of India, 2011

Table 2-29: Demography details of Project District

Sr. No.	District	HH	Population			Literacy Rate %			Sex Ratio	Density / sq. km.	Schedule Caste			Schedule Tribes				
			Male	Female	Total	Male	Female	Total			Male	Female	Total	%	Male	Female	Total	%
1	North Tripura	90294	212650	204791	417441	91.27	84.39	87.90	963	289	30958	29596	60554	14.51	59494	57612	117106	28.05
2	Dhalai	84509	194544	183686	378230	91.31	79.79	85.72	944	158	31461	30227	61688	16.31	106759	103849	210608	55.68
3	Unakoti	62061	276506	140210	136296	90.92	82.79	86.91	972	467	27417	26997	54414	19.68	31622	30698	62320	22.54

Note : Sex Ratio = (Females / 1000 * males), %=(ST or SC total/ Total District population*100)

Table 2-30: Occupational Pattern of Project Districts

Sr. No.	District	Total Workers				Main Workers				Marginal Workers				Non-Worker			
		Male	Female	Total	%	Male	Female	Total	%	Male	Female	Total	%	Male	Female	Total	%
1	North Tripura & Unakoti	186034	62633	248667	35.83	155211	30894	186105	26.82	30823	31739	62562	9.02	166826	278454	4452880	64.17
2	Dhalai	105657	50174	155831	41.20	88877	19382	108259	28.62	16780	30792	47572	12.58	8887	133512	222399	58.80

Note: Total Worker% = Total Worker/ Total Population x 100, Main Worker% = Main Worker/ Total Worker x 100, Marginal Worker% = Marginal Worker/ Total Worker x 100, Non-Worker% = Non-Worker/ Total Population x 100

Table 2-31: Main Worker Profile of Project Districts

Sr. No.	District	Main Workers	Cultivators				Agricultural Labor				Household Industry Worker				Other Workers			
			Male	Female	Total	%	Male	Female	Total	%	Male	Female	Total	%	Male	Female	Total	%
1	North Tripura & Unakoti	248667	39370	9916	49286	19.82	31027	12950	43977	17.69	2901	4187	7088	2.85	112736	35580	148316	59.64
2	Dhalai	155831	33944	12012	45956	29.49	22622	19579	42201	27.08	1046	1824	2870	1084	48045	16759	64804	41.59

Note: Total Cultivator% = Total Cultivator/ Main Worker x 100, Total Agricultural Labour% = Total Agricultural Labour/ Main Worker x 100, Household Industry Worker% = Total Household Industry Worker/ Main Worker x 100, Total Other Workers% = Total Other Workers/ Main Worker x 100

2.6 Baseline Description of the Subproject areas

The baseline data around the sub-project sites is broadly in conformity with the data of the project district i.e., North Tripura, Dhalai and Unakoti. However, the topography encountered around the TL and DL route alignment is mostly 50% to 60 % hilly and slopy terrain and 40 to 50% plain. All the S/S are located in plain area. All the S/S are planned on plain land parcels. In case tower/pole locations are on hill terrain and where ever positioning of tower on hill top is not possible leg extension is being utilized so as to minimize/ avoid benching/ revetment and to provide great stability.

Of the total 3 TL, all lines are passing through terrain of rock structure of Moderately dissected Structural Hills and Less dissected Denudational Hills as per TLs feature survey. The rock type is mostly of shaly sandstone along with sandstone / limestone bands and pebble bed / conglomerate. A major portion of the TL passes through agricultural / paddy fields, and the remaining portion through rubber tree plantation/ tree owned by private owner. The proposed TL Kailasahar-Dharmanagar 132 KV D/C line involves 14.3586 Ha of notified RF land and confirms the forest clearance under Forest (Conservation) Act, 1980. Stage-I & Stage-II (final) approval obtained on 10.04.18 & 07.06.19 respectively. **Please refer Annexure 5 for Forest clearance obtained.** Besides all protected areas like NP, WLS, Biosphere Reserve etc.; Natural habitats, IBAs, Sacred groves, Wetlands and designated wildlife/elephant etc. have been completely avoided.

The land use along the RoW (27 m for 132 kV) of lines comprises of agricultural land, private plantation and govt. land. The total length of the FEAR II project TLs is 26.401 km and total number of 102 towers are being/to be erected for all proposed 3 TLs. The TL length earlier in IEAR was 22.5 km. **The details are discussed in Chapter 4.** However, though the length is increased, as a result, the environmental and social footprints have been reduced as envisaged in IEAR avoiding the environmental sensitive areas like habitation, PA and Forest area upto larger extent. Due impact assessment and mitigation measures are implemented as per prescribed EMP and following ESPPF prepared by TSECL. The details are discussed in Chapter 5.

As per line feature survey all DLs are passing mostly through Less dissected Denudational Hills and moderate fill valley rock structure terrain. Rock type is majorly sandstone. A major portion of the DL passes through agricultural / paddy fields, and the remaining portion through rubber plantation/ tree owned by private owner. The DL at some locations crossing Railway, metal road, water bodies. The DLs route and 132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) is having 0.9972 Ha of RF thus necessitate forest clearance under Forest (Conservation) Act, 1980. Stage-I clearance issued on 02.03.2021. Working permission obtained on 10.05.2021 33 kV Jawaharnagar - Dhumachhera line has 21.33 Ha of RF and Stage-I issued on 28.06.2021. Working permission obtained on 29.09.21. Besides all protected areas like NP, WLS, Biosphere Reserve etc.; Natural habitats, IBAs, Sacred groves, Wetlands and designated wildlife/elephant passage etc. have been completely avoided. The DLs have been aligned mostly along the existing roads by avoiding dense forest areas. Here, the RoW corridor being narrower (15m for 33 kV) tend further reduction of the necessity of tree felling. Much of the line would only need lopping of branches for unhindered passage.

The land use along the RoW of DLs comprises of agricultural land, private plantation and govt. land. It has been observed that there are variations in final route length of DL from earlier routes considered and studied in IEAR. The original length of the DLs has been increased to 37 km from earlier 30 km as presented in IEAR due to further optimization during ground truthing survey. The environment & social sensitive areas are avoided/minimized from earlier identified areas in IEAR/EMP and lesser impacts are anticipated. A total of around 1228 poles are being/to be erected

for all 5 proposed DLs. Due impact assessment and mitigation measures are implemented which are discussed in Chapter 5.

Land for all the proposed 10 S/S is already in possession with TSECL and no fresh land is needed to be acquired. All the tower locations and S/S are easily accessible through existing road to carryout construction and maintenance activity and construction of new approach road is not required. The S/S plot land is fairly plain and without encroachment. The details of requirement of approach road along with google map photos of substations depicting status of approach have been placed at **Table 2.32** and **Map.27**. However, it is to submit that in few cases i.e., 150m approach road at 132/33 kV S/S Ambassa, 25m approach road at 33/11kV Jawaharnagar, 5m each at 33/11 kV 82 Mile and 33/11kV Dhumachhera only strengthening / upgradation work of existing road will be undertaken to facilitate movement of construction materials and machineries to the construction sites of S/S in consultation with local authority and villagers.

Table 2-32: Baseline Environmental Settings at Substation Locations

Sr. No	Name of SS	Area (Sq.mt)	Location	Surrounding	Accessibility	Land Status
1	132/33 kV New S/S at Manu	8822.15	Adjacent to NH-44 (Between Manu and Kumarghat) Co-ordinate- 24°00'629N, 91°59'947E	South, East, West: Tilla land, North: NH44.	Adjacent to NH- 44 (Between Manu - Kumarghat). However, for access to Site approach road may be required	TSECL Own Land
2	Augmentation of 132/33 kV S/S at Ambassa	4046.86	Inside existing 132 kV Ambassa S/S Complex. Co-ordinate- 23°55.310'N/91°50.966'E	Inside existing 132kV Ambassa S/S Complex	Besides NH - 44 (Teliamura - Ambassa) Extension of approach road of 150 mt is required	TSECL Own Land
3	Extension of 132/33 kV S/S at Kailashahar	4046.86	Inside existing 132 kV Kailashahar S/S Complex. Co-ordinate- 24°17.557'N, 92°01.955'E	Inside existing 132kV Kailashahar S/S Complex	Besides Kailashahar - Kumarghat Road	TSECL Own Land
4	Extension of 132/33 kV S/S at Dharmanagar	4046.86	Inside existing 132 kV Mission Tilla S/S Complex. Co-ordinate- 24°21.731'N/ 92°11.535'E	Inside existing 132kV Mission Tilla S/S Complex.	Adjacent to Dharmanagar - Panisagar Road	TSECL Own Land
5	33/11 kV New S/S at Tilla Bazar	6394.03	Near Tilla Bazar School. Co-ordinate- 24°21'06.7"N, 92°00'02.7 E"	East: Ice factory. West: School, North: PWD Road, South: Lake.	For access to site 30 mts approach road may be required.	Land available with TSECL
6	33/11 kV New S/S at Chailengta	2994.67	Coordinate- N- 23°56'23.7", E- 091°59'22.3"	East : Tilla, West: Brick soiling road. North: Manu Chailengta Road. South: Lunga	Close to Manu-Chailengta Road. However, 30 mts approach road may be required.	Land available with TSECL
7	33/11 kV New S/S at Jawaharnagar	7972.31	Adjacent to NH -44 Co-ordinate N- 23°55'09.57", E -091°53'22.9"	North :NH-44 Road, South: Cherra West: Tilla land , East: Tilla land	Adjacent to NH - 44 Road. New 25 mt approach road is required for extension	Land available with TSECL
8	33/11 kV New S/S at 82 Mile	2913.74	Adjacent to Nepal Tilla to 82 Mile PWD road Co-ordinate- 22°04'59.3"N- 91°59'43.7"E	East: Tilla land West South: Tilla land. North: Nepal Tilla to 82 Mile PWD road.	Nepal Tilla to 82 Mile PWD road. No new approach road required.	Land available with TSECL
9	33/11 kV New S/S at Dhumachara	5584.66	Land is located on MLA Bari PWD Road. Co-ordinate- 24°01'28.6", N- 91°58'48.5" E	South: Tilla. East & North: Manu River. West: PWD Road (MLA Bari Road)	Close to PWD Road. 5 m length of new extension of approach road required.	Land available with TSECL
10	33/11 kV New S/S at Durgachou muhani	12545.3	Land is located adjacent to Durga chowmuhani to Choto surma road. Co-ordinate N- 24°07'23.27", E- 91°51'47.28"	West: Manikbhandar-Kumarghat road, East: Durga chow'ani to Choto surma road. North: Tilla	Approximately 90 mts. new approach road may be required from existing road.	Land available with TSECL

Map 2-27: Google Maps of Substations
Extension of 132/33 KV S/S at Dharmanagar



S/S Site in 2017 – Before Extension Work



S/S Site in 2021 – Extension Work in Progress

Detailed S/S site Photographs are presented in Chapter 4 in Section 4.3

Extension of 132/33 kV S/S at Kailasahar



Before extension work - 2017



S/S Site in 2021 - Extension Work in Progress

Detailed S/S site Photographs are presented in Chapter 4 in Section 4.3

Establishment of 2 x 50 MVA, 132/33 kV new S/S at Manu



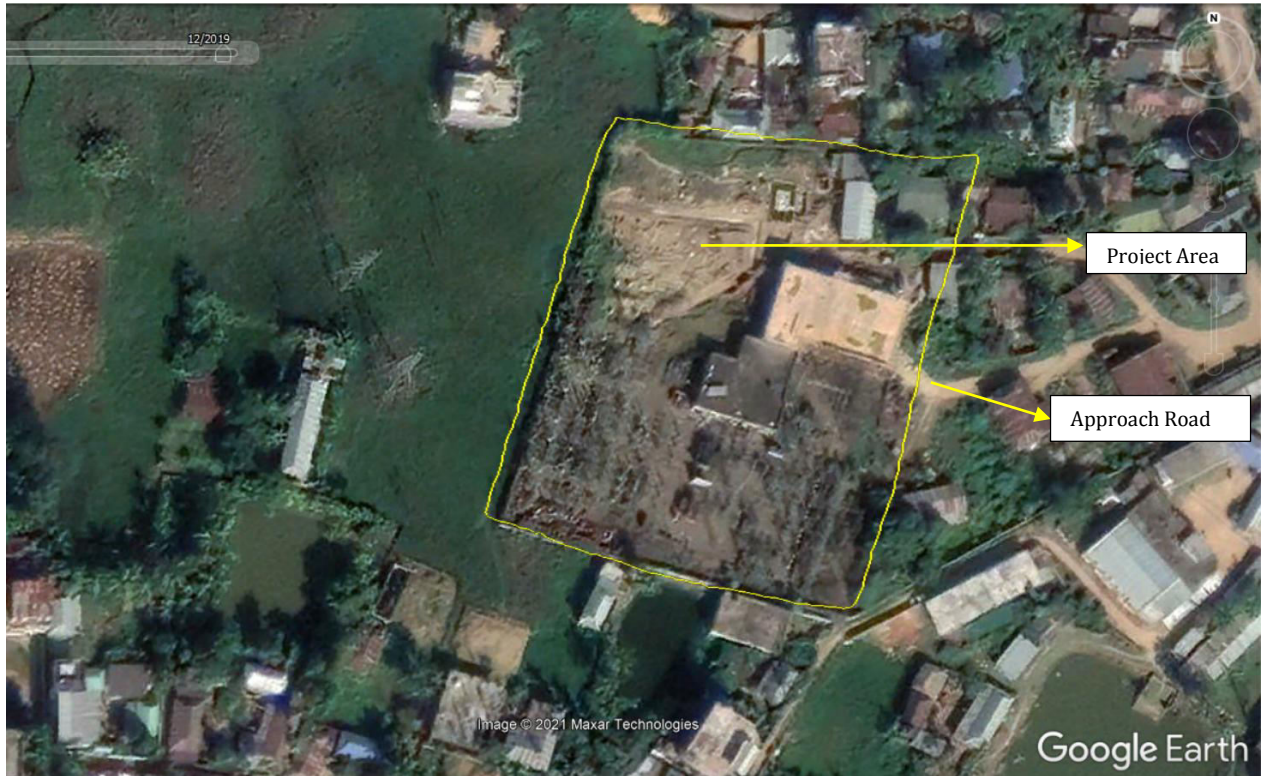
S/S Site in 2017 – Before Construction Work



S/S Site in 2021 – Construction Work in Progress

Detailed S/S site Photographs are presented in Chapter 4 in Section 4.3

Augmentation of 132/33 KV S/S at Ambassa



S/S Site in 2019 – Before Augmentation Work Start



S/S Site in 2021 – Augmentation Work is Completed

Detailed S/S site Photographs are presented in Chapter 4 in Section 4.3

Establishment of 2x5 MVA, 33/11 kV new S/S at Jawahar Nagar



S/S Site in 2017 – Before Construction Work



S/S Site in 2021 – Construction Work under Progress

Detailed S/S site Photographs are presented in Chapter 4 in Section 4.3

Establishment of 2x5 MVA, 33/11 kV new S/S at 82 Mile



S/S Site in 2017 – Before Construction Work Start



S/S Site in 2021 – Construction Work in Progress

Detailed S/S site Photographs are presented in Chapter 4 in Section 4.3

Establishment of 2x5 MVA, 33/11 kV new S/S at Dhumachhera



S/S Site in 2019 – Before Construction Work



S/S Site in 2021 – Work not Started

Detailed S/S site Photographs are presented in Chapter 4 in Section 4.3

Establishment of 2x5 MVA, 33/11 kV new S/S at Tilla Bazar



S/S Site in 2020 – Work Not Started



S/S Site in 2021 – Work Not Started

Detailed S/S site Photographs are presented in Chapter 4 in Section 4.3

Establishment of 33/11 KV S/S at Chailengta



S/S Site in 2018 – Before Construction Work



S/S Site in 2021 – Construction Work in progress

Detailed S/S site Photographs are presented in Chapter 4 in Section 4.3

Establishment of 2x5 MVA, 33/11 kV new S/S at Durgachowmohni



S/S Site in 2017 – Before Construction Work Start



S/S Site in 2021 – Construction Work in progress

Detailed S/S site Photographs are presented in Chapter 4 in Section 4.3

Regular environmental monitoring is being carried out at S/S locations during Construction activity. It is being observed that during construction activity dust emission is not envisaged as water sprinkling activity is regularly carried out at construction site which has nullified the impact of dust emission in the area. Construction activity is carried out in the confined space and locations are far from nearby habitations. Thus, Noise impacts are not envisaged. However, the baseline environmental monitoring for water and noise environment at various locations of subproject construction sites are being carried out as regular activity as part of EMP during construction phase by construction contractors. All the analysis results are found within prescribed limits. **Please refer Appendix A.**

The during the field surveys it was tried to survey minimum 10% of the route for flora data collection, which in some cases constituted a continuous stretch and, in some cases, could be covered in parts. The stretches were selected considering diversity of flora. At some places along the alignment, forest plantation is recorded e.g., rubber plantation which is homogenous. At some stretches the diversified flora is recorded. As regard substation, the whole substation area was covered. In Tripura State rare and endangered species of both Flora and Fauna are listed in **Section 2.4**. Also, during field survey in project area *Aegle marmelos* near threatened species as per Conservation Status IUCN (2020.1) is recorded. *Lantana Camera* is invasive species recorded during filed survey. The fauna elements were not found during field surveys in the project areas except some bird and common fauna. Hence the data was collected through consultations with local public, Forest department officials and POWERGRID officials working in the project area. The detailed vegetation assessment is discussed in **Section 2.4.4** and list of vegetation recorded during field survey is depicted in **Appendix A under Heading D**.

The tree cutting in non-forest area was avoided during construction activities at S/S locations and at Tls to the maximum possible extent. Trees are only removed to maintain electrical safety clearance. During land development prior to construction of substation shrubs/trees on the plot are cleared that create hinderance to work. In Tls corridor, only 3 m strip below each conductor is cleared during stringing activities and natural vegetation is allowed in cleared strips barring one which is kept for maintenance activity. In remaining corridor, mostly pruning/looping is done to maintain electrical clearance. There is no compensatory plantation against tree felling in non-forest land. Tree Extraction vide notification No.F.7 (44)/For/FP-200I/PT11/29.042 dated 17.01.2002 is followed. **Please Refer Annexure 11**. However, compensation is paid to farmers/owners after assessment of actual damage duly certified by revenue/forest/horticulture/rubber board authority as per provisions of The Electricity Act, 2003 & The Indian Telegraph Act, 1885. During our site visit and verification of documents it has been observed that the IA is complying with all such provisions in spirit.

It is mandatory to do the compensatory afforestation as per the forest clearances obtained for the project. As per specific conditions in Forest Clearance obtained from MoEFCC, the compensatory afforestation is to be / being carried out on double the degraded forest area as suggested and identified by forest department. POWERGRID / IA has paid the requisite cost as per prescribed law for the compensatory afforestation (CAMPA) to Forest department. It may also be noted that the user agency/ IA has no role in taking compensatory afforestation activity except deposition of CA cost to forest dept/CAMPA rather it is the forest dept responsibility to undertake the plantation as per CA scheme.

Electricity is one of the basic needs of 21st century. The subproject area is overall backward in terms of economic activities and lacks good communication system, shortage of power and lack of proper irrigation & marketing facilities adds to the poverty of the district. The current project is helpful for local people of project district to uplift their economic condition. After improvement of the power supply, the socioeconomic status of this area will be improved this will possibly attract industrial & commercial investments in this area. While discussing with local people of project area, it was observed that they are very helpful and cooperating contractors and Power Grid personnel for completion of this project. In conclusion, local people feel that their socioeconomic condition will upgrade because of this project.

3. POLICY, LEGAL & REGULATORY FRAMEWORK

3.1 Introduction

Power transmission project activities by their inherent nature and flexibility have negligible impacts on environmental and social attributes. Indian laws relating to environmental and social issues have strengthened in the last decade both due to local needs and international commitments. TSECL undertakes its activities within the purview of Indian and State specific laws keeping in mind appropriate international obligations and directives and guidelines with respect to environmental and social considerations of Funding Agencies.

3.2 Constitutional Provisions

Subsequent to the first United Nations Conference on Human Environment at Stockholm in June, 1972, which emphasized the need to preserve and protect the natural environment, the Constitution of India was amended through the historical 42nd Amendment Act, 1976 by inserting Article 48-A and 51-A (g) for protection and promotion of the environment under the Directive Principles of State Policy and the Fundamental Duties respectively. The amendment, inter alia provide:

- "The State shall endeavor to protect and improve the environment and to safeguard the forests and wildlife of the country". (New Article 48A)
- "It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures". (New Article 51 A (g))
- Article 21 of the constitution provides, "no person shall be deprived of his life or personal liberty except according to procedure established by law".

Article 21 is the heart of the fundamental rights and has received expanded meaning from time to time after the decision of the Supreme Court in 1978. The Article 21 guarantee fundamental right to life – a life of dignity to be lived in a proper environment, free of danger of disease and infection. The right to live in a healthy environment as part of Article 21 of the Constitution. Recently, Supreme Court has broadly and liberally interpreted the Article 21, transgressed into the area of protection of environment, and held that the protection of environment and citizen's right to live in eco-friendly atmosphere interpreted as the basic right guaranteed under Article 21.

Thus, the Indian Constitution has now two-fold provision:

- a. On the one hand, it gives directive to the State for the protection and improvement of environment.
- b. On the other hand, the citizens owe a constitutional duty to protect and improve natural environment.

Sixth Schedule

In Tripura, special provisions have been extended to the Tribal Areas under the 6th Schedule **[Articles 244(2) and 275(1)]** in addition to basic fundamental rights. Besides, the Tripura Panchayats (Second Amendment) Act, 1998 of Principal Act, 1993 includes ADC in Government functioning. The Sixth Schedule is entirely focused at protection of tribal areas and interests by allowing self-governance through constitutional institutions at the district or regional level.

These institutions are entrusted with the twin task of protecting tribal cultures and customs and undertaking development tasks.

The Sixth Schedule of the Constitution applies to a large part of the state, which is under the jurisdiction of the “Tripura Tribal Areas Autonomous District Council” (TTAADC). Out of the total geographical area of 10,491 sq. km, 7,133 sq. km (about 68%) is under the TTAADC.

Constitutional provisions in regard to social safeguards are well enshrined in the preamble such as JUSTICE, social, economic and political; LIBERTY of thought, expression, belief, faith and worship; EQUALITY of status and of opportunity; FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation. Fundamental Rights and Directive Principles guarantee the right to life and liberty. Health, safety and livelihood have been interpreted as part of this larger right. Social safeguards provisions are dealt in detail in different Article such as Article-14, 15 17, 23, 24, 25, 46, 330, 332 etc. POWERGRID have implemented the said constitutional provision in true spirit to fulfill its environmental and social obligations and responsibilities.

3.3 Environmental Mandatory Requirements

The applicable national and WB acts, rules and relevant policies in the context of the project are discussed in subsequent sections and its status of compliance are presented in **Table 3.1**.

3.3.1 National/State

➤ **GoT order/sanction under The Electricity Act, 2003**

Sanction of GoT is a mandatory requirement for taking up any new transmission project under the section 68(1) of The Electricity Act, 2003. The sanction authorizes TSECL to plan and coordinate activities to commission the new project. Electricity Act does not explicitly deal with environmental implications of activities related to power transmission and construction of S/S. However, TSECL integrates environmental protection within its project activities.

➤ **Forest Clearance under the Forest (Conservation) Act, 1980**

When transmission projects pass through forest land, clearance has to be obtained from relevant authorities under the Forest (Conservation) Act, 1980. This Act was enacted to prevent rapid deforestation and environmental degradation. State governments cannot de-reserve any forest land or authorize its use for any non-forest purposes without approval from the Central government. TSECL projects, when involving forest areas, undergo detailed review and approval procedures to obtain a Forest Clearance certificate from MoEF&CC, Government of India before starting any construction activity in designated forest area.

➤ **Environmental Clearances under Environment (Protection) Act, 1986**

Since TL projects are environmentally clean and do not involve any disposal of solid waste, effluents and hazardous substances in land, air and water they are kept out of the purview of Environment (Protection) Act, 1986. However, amendment in the Environment (Protection) Act, 1986 on 7th May 1992 made it necessary to obtain clearance from MoEF&CC for power transmission projects in two districts in the Aravalli (viz., Alwar in Rajasthan and Gurgaon in Haryana). The Aravalli range, in these two areas, is heavily degraded; hence, any industrial

activity there becomes critical. Environment Impact Notification, 1994 & 2006 lays down specific project categories that require clearance from MoEF&CC Power transmission projects are not included in this list.

➤ **Ozone Depleting Substances (Regulation and Control) Rules, 2000**

MoEF&CC vide its notification dated 17th July, 2000 under the section of 6, 8 and 25 of the Environment (Protection) Act, 1986 has notified rules for regulation /control of Ozone Depleting Substances under Montreal Protocol adopted on 16th September 1987. As per the notification certain control and regulation has been imposed on manufacturing, import, export and use of these compounds. TSECL follow the provisions of notification and phase out all equipment which uses these substances and planning to achieve CFC free organization in near future.

➤ **Batteries (Management and Handling) Rules, 2001**

MoEF&CC vide its notification dated 16th May, 2001 under the section of 6, 8 and 25 of the Environment (Protection) Act, 1986 has put certain restriction on disposal of used batteries and its handling. As per the notification it is the responsibility of bulk consumer (TSECL) to ensure that used batteries are not disposed of, in any manner, other than by depositing with the dealer / manufacturer / registered recycler /importer / reconditioner or at the designated collection centers and to file half yearly return in prescribed form to the concerned State Pollution Control Board.

➤ **Hazardous Wastes (Management, Handling and Tran boundary Movement) Rules, 2008**

Vide notification dated 24th September, 2008 under the EPA, 1986, MoEF&CC notified rules for environmentally sound management of hazardous wastes to ensure that the hazardous wastes are managed in a manner which shall protect health and the environment against the adverse effects that may result from such waste. The used transformer oil has been declared as hazardous wastes vide this notification.

TSECL, being a bulk user of transformer oil complied with the provisions of the said rules (MoEF&CC notification dated 24th September 2008) if the practice of storing of used oil is maintained. In case it is decided to outsource the process of recycle of used oil to registered recycler as per the provisions of notification then TSECL is being submitting the desired return in prescribed form to concerned SPCB at the time of disposal of used oil.

➤ **E-waste (Management and Handling) Rules, 2016**

E-Waste (Management and Handling) Rules, 2011 has notified the E-Waste (Management) Rules, 2016 vide G.S.R. 338(E) dated 23.03.2016 which is effective from 01-10-2016. These rules are applicable to every producer, consumer or bulk consumer, collection center, dismantler and recycler of e-waste involved in the manufacture, sale, purchase and processing of electrical and electronic equipment or components specified in schedule – I of these Rules. Liability for damages caused to the environment or third party due to improper management of e-waste including provision for levying financial penalty for violation of provisions of the Rules has also been introduced.

➤ **The Biological Diversity Act, 2002**

Under the United Nations Convention on Biological Diversity signed at Rio de Janeiro on the 5th June, 1992 of which India is also a party, GoI has enacted the Biological Diversity Act, 2002 to provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith. As per the provision of act certain area which are rich in biodiversity and encompasses unique and representative ecosystems are identified and designated as Biosphere Reserve to facilitate its conservation. All restrictions applicable to protected areas like NP/ WLS are also applicable to these reserves TSECL is abide by the provision of act wherever applicable, and always try to totally avoid these biosphere reserves while finalizing the route alignment.

➤ **Tree Extraction vide notification No.F.7 (44)/For/FP-200I/PT11/29.042 dated 17.01.2002**

This specify which plantations need to be registered, which tree species do not require felling permission, what process is to be followed in order to fell trees outside non recorded forest areas, how is the transit of timber originating from non-recorded forest areas how is the transit of timber originating from non-recorded forest areas regulated and how and why timber can be confiscated to Government. TSECL follows all provisions of this rule for felling of trees from nonforest land. **The Notification and provisions are given in Annexure 11 for reference.**

➤ **Ancient Monuments & Archaeological Sites and Remains Act, 1958**

An Act to provide for the preservation of ancient and historical monuments and archaeological sites and remains of national importance, for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects.

➤ **The Scheduled Tribes & Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006**

This act recognizes and vests the forest rights and occupation in forest land to forest dwelling. Scheduled Tribes and other traditional forest dwellers who have been residing in such forests for generations but whose rights could not be recognized.

The definitions of forest dwelling schedule tribes, forestland, forest rights, forest villages, etc. have been included in Section 2 of the Act. The Union Ministry of Tribal Affairs (MoTA) is the nodal agency for implementation of the Act while field implementation is the responsibility of the respective State government agencies. Its implementation has also been linked with forest clearance process under Forest (Conservation) Act, 1980 w.e.f. August 2009 by MoEF&CC. TSECL is abide to the provisions of the act if any portion of the TL is passing through forest land, in occupation of the forest dwelling scheduled tribes and other traditional forest dwellers for laying of TLs. However, for linear projects including TLs obtaining of NoC from the gram Sabha has been exempted for the requirement of FRA compliance as per MoEF&CC circular dated 5th February 2013 and 15th January 2014.

3.3.2 Funding Agency

For TSECL, mandatory environment requirements with respect to WB Operational Policies are as follows:

➤ **World Bank (WB) OP 4.01: Environmental Assessment**

The policy objective is to ensure the environmental and social soundness and sustainability of investment projects and support integration of environmental and social aspects of projects in the decision-making process.

TSECL takes remedial measures to prevent, minimize, mitigate, or compensate for adverse impact and improve environmental performance. Environment Assessment is taken into account the natural environment, human health and safety, and social aspects and trans-boundary and global environmental aspects. During EA process public is also informed at every stage of project execution and their views are considered during decision-making process.

➤ **World Bank OP 4.04: Natural Habitats**

The policy objective is to promote sustainable development by supporting the protection, conservation, maintenance, and rehabilitation of natural habitats and their functions.

➤ **World Bank OP 4.11: Physical Cultural Resources**

The policy objective is to preserve PCR and in avoiding their destruction or damage. PCR includes resources of archaeological, paleontological, historical, architectural, and religious (including graveyards and burial sites), aesthetic, or other cultural significance.

➤ **World Bank OP 4.36: Forests**

The objective of this policy is to realize the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests.

➤ **WB EHS Guidelines for Electric power T&D**

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice (GIIP). The EHS Guidelines for Electric Power T&D include information relevant to power transmission between a generation facility and a S/S located within an electricity grid. The following section provides a summary of EHS issues associated with electric power T&D that occur during the construction and operation phases of a facility, along with recommendations for their management. Additional recommendations for the management of environmental issues during the construction and decommissioning phases of power T&D systems are provided in the General EHS Guidelines. Examples of the impacts addressed in the General EHS Guidelines include:

- Construction site waste generation;
- Soil erosion and sediment control from materials sourcing areas and site preparation activities;

- Fugitive dust and other emissions (e.g., from vehicle traffic, land clearing activities, and materials stockpiles);
- Noise from heavy equipment and truck traffic;
- Potential for hazardous materials and oil spills associated with heavy equipment operation and fueling activities.

3.4 Social Mandatory Requirements

The applicable national and WB acts, rules and relevant policies in the context of the project are discussed in subsequent sections and its status of compliance are presented in **Table 3.2**.

3.4.1 National/State

➤ **The Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013 (RFCTLARRA)**

Govt. of India replaced the old Land Acquisition Act, 1894 and notified the new RFCTLARRA, 2013 which came into force from 1st January 2014. This act ensures appropriate identification of the affected families/households, fair compensation and rehabilitation of titleholders and non-titleholders. However, the new act i.e. RFCTLARRA, 2013 authorizes State Govt. (i.e. GoT) or its authorized Government agency to complete the whole process of acquisition of private land including Social Impact Assessment (SIA), Action Plan for R&R (i.e. Rehabilitation and Resettlement) & its implementation and the TSECL responsibility is limited to identification and selection of suitable land based on technical requirement and ensuring budget allocation. Also, as per Section 112 of the LARR Act, 2013, Tripura State has already notified LARR Rules, 2015.

➤ **Rights of Way and Compensation under Electricity Act, 2003**

The Electricity Act, 2003 has a provision for notifying transmission company under section 164 (B) to avail benefits of eminent domain provided under the Indian Telegraph Act, 1885. Under this section TSECL may seeks for GoT authorization to exercise all the powers that the Telegraph authority possesses and can spot, construct and erect towers without acquiring the land. Moreover, all damages due to its activity are being compensated at market rate. In case of agricultural or private land the provisions of section- 67 and/or section-68 (5 & 6) of the Electricity Act, 2003 and section-10 of the Indian Telegraph Act, 1885 are followed for assessment and payment of compensation towards such damages.

➤ **The Right to Information Act, 2005**

Right to Information Act 2005 mandates timely response to citizen requests for government information. It is an initiative taken by Department of Personnel and Training, Ministry of Personnel, Public Grievances and Pensions to provide a- RTI Portal Gateway to the citizens for quick search of information on the details of first Appellate Authorities, PIOs etc. amongst others, besides access to RTI related information / disclosures published on the web by various Public Authorities under the government of India as well as the State Governments.

➤ **Indian Treasure Trove Act, 1878 as amended in 1949**

It defines treasure specifically as "anything of any value hidden in the soil" and worth as little as 10 rupees. The finder of any such treasure, according to this law, needs to inform the most senior local official of the "nature and amount or approximate value of such treasure and the place where it was found". When any person is entitled, under any reservation in an instrument of transfer of any land or thing affixed thereto, to treasure in such land or thing, he shall, for the purposes of this Act, be deemed to be the owner of such land or thing.

3.4.2 Funding Agency

For TSECL, mandatory social requirements with respect to WB Operational Policies are as follows.

➤ **World Bank OP 4.12: Involuntary Resettlement**

These policies cover direct economic and social impacts both resulting from Bank- assisted investment projects, and are caused by the involuntary taking of land. To avoid or minimize involuntary resettlement and, where this is not feasible, assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

➤ **World Bank OP 4.10: Indigenous People (IP)**

This policy contributes to the Bank's mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of Indigenous Peoples. The objective is to design and implement projects in a way that fosters full respect for indigenous peoples" so that they receive culturally compatible social and economic benefits, and do not suffer adverse effects during the development process. The project is ascertained broad community support for the project based on social assessment and free prior and informed consultation with the affected Tribal community, if any.

➤ **WB Managing the Risks of Adverse Impacts on Communities from Temporary Project Induced Labour Influx 2016**

Provides guidance on identifying, assessing and managing the risks of adverse social and environmental impacts that are associated with the temporary influx of labor resulting from Bank supported projects. provide concrete guidance on how to approach temporary labor influx within the environmental and social assessment process.

Table 3-1: Environmental Provisions

Sr. No.	Acts, Notification & Policies	Applicability to the project	Status of compliance
1. National			
1.1	Electricity Act, 2003	Applicable - TL projects are constructed under the ambit of Electricity Act, 2003 following the provisions of Section 67 & 68 of act	Complied with: MoP, GoI approved the NERPSIP Comprehensive scheme for six North Eastern States including Tripura under vide its Office Memorandum dated 1st December 2014.
1.2	Forest (Conservation) Act, 1980	Applicable-Since Forest area of 14.386 Ha of RF in Kailasahar-Dharmanagar 132 KV D/C line 0.9973 Ha of RF in 132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line, 21.33 Ha of RF in 33 kV Jawaharnagar - Dhumachera forest clearance under FC Act 1980 is applicable in instant case.	Stage-I & Stage-II (final) approval obtained on 10 th April 18 & 07 th June 19 respectively for Kailasahar- Dharmanagar 132 KV D/C line Stage-I clearance issued on 2 nd March 2021 and Working permission obtained on 10 th May 2021 for 132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line For 33 kV Jawaharnagar - Dhumachera line- Stage-I issued on 28.06.2021. CA, NPV deposited. Working permission obtained on 29.09.21.
1.3	Environment (Protection) Act, 1986/Environment Impact Assessment Notification, 2006	Applicable Though some limited compliance measures notified under this EPA, 1986 are to be adhered to relevant rules and regulations under the EPA, 1986 applicable to the operations of TSECL	Complied with: Though applicable as it is umbrella legislation, however, as such statutory permission/ license is not required
(i)	Ozone depleting Substances (Regulation and Control) Rules, 2000	Applicable As per the notification, certain control and regulation has been imposed on manufacturing, import, export, and use of these compounds.	Complied with: Only CFC free equipment are being procured / specified in tender document
(ii)	Batteries (Management and Handling) Rules, 2001	Applicable during operation phase only Used batteries to be disposed to dealers, manufacturer, registered recycler, reconditioners or at the designated collection centers only. A half-yearly return to be filed as per Form-8 to the TSPCB	Batteries will be used during operational phase. Hence, the issue of proper handling and disposal of batteries as per the rules is not an issue during the construction phase.
(iii)	Hazardous Wastes (Management, Handling and Trans boundary Movement) Rules, 2016	Applicable Requires proper handling, storage and disposed only to authorized disposal facility (registered recyclers/ reprocessors). In case it is decided to outsource the process of recycle of used oil to registered recycler as per the provisions of notification then TSECL shall submit the desired return in prescribed form to concerned TSPCB at the time of disposal of used oil	Generally Used oil is generated after 10-15 years of operation of transformers and therefore, the handling and disposal of hazardous transformer oil is not an issue at this stage.
(iv)	E-waste (Management and Handling) Rules, 2016	Applicable To dispose e-waste generated in environmentally sound manner by channelizing to authorized collection centers/ registered dismantler /	E-waste disposal is not an issue during construction phase.

Sr. No.	Acts, Notification & Policies	Applicability to the project	Status of compliance
		recyclers / return to producers. TSECL, being a bulk consumer of electrical and electronics equipment shall maintain record as per form-2 for scrutiny by TSPCB	
1.4	Biological Diversity Act,2002	Not applicable as the project does not involve any biosphere reserves	
1.5	Ancient Monuments & Archaeological Sites and Remains Act, 1958	Not Applicable. All such areas have been completely avoided.	Not Required
1.6	Tree Extraction vide notification No.F.7 (44)/For/FP-200 I/PT11/29.042 dated 17.01.2002	Applicable The route has been selected in such a way that it has minimum obstructions under its alignment & majority of the trees have been trimmed. Only such trees are felled which create hindrance to electrical safety after due compliance of applicable tree felling provisions. It was tried to retain the trees on site. Only grass growth on the S/S plot was cleared during land development prior to construction.	NOC is obtained under the provision There is no provision of compensatory plantation in non-forest area in lieu of tree cutting in Tripura State
1.12	The Scheduled Tribes & Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	Applicable as there is forest land involvement	Obtained
2. World Bank Operational Policy			
2.1	OP 4.01: Environmental Assessment	E & S aspects of the project have already been integrated into the management procedures based on comprehensive environment assessment undertaken by IA during 2015.	Complied with: E & S aspects of the project have already been integrated into management procedures based on comprehensive environment assessment undertaken by IA during 2015
2.2	OP- 4.04: Natural Habitats	The present project involves natural habitats such as biodiversity area, forest area, protected area etc. Hence Applicable	Required
2.3	OP-4.11: Physical Cultural Resources (PCR)	The present project does not encroach upon any such resources	Not Required
2.4	OP-4.36: Forests	Applicable-Since Forest area of 14.386 Ha of RF in Kailasahar-Dharmanagar 132 KV D/C line 0.9973 Ha of RF in 132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line 21.33 Ha of RF in 33 kV Jawaharnagar - Dhumachera line forest clearance under FC Act 1980 is applicable in instant case.	Complied. Stage-I & Stage-II (final) approval obtained on 10 th April 18 & 07 th June 19 respectively for Kailasahar-Dharmanagar 132 KV D/C line Stage-I clearance issued on 2 nd March 2021 and Working permission obtained on 10 th May 2021 for 33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line 33 kV Jawaharnagar - Dhumachhera line- Stage-I issued on 28.06.2021.

Sr. No.	Acts, Notification & Policies	Applicability to the project	Status of compliance
2.5	WB EHS Guidelines for Electric power T&D	Applicable provisions of EHS guidelines have been followed during the implementation of the project	Complied with: EHS guidelines are being followed during project implementation.

Table 3-2: Social Provisions

Sr. No.	Acts, Notification & Policies	Applicability to the project	Status of compliance
1. National			
1.1	Sixth schedule of the constitution	Not applicable as the subproject district doesn't fall under six schedule areas.	Not Required
1.2	The Right to fair compensation and transparency in land acquisition, rehabilitation & resettlement act, 2013	Not Applicable as all the land parcels required for construction of S/S are already in the possession of TSECL. Thus, securing of fresh land was not necessitated	Not Required
1.3	Right of Way (RoW) & compensation	Applicable. TSECL has been vested with the powers of Telegraph Authority under Section - 164 of the Electricity Act. Moreover, all damages due to its activity shall be compensated at market rate. In case of agricultural or private land the provisions of section-67 and or section-68 (5 & 6) of the Electricity Act, 2003 and section-10 of the Indian Telegraph Act, 1885 are followed for assessment and payment of compensation towards such damages.	Complied with: Implementing Agency has already been vested with powers of telegraph authority by GoI vide Gazette Notification dated Dec.24, 2003. However, compensation for all damages are being paid to the individual land owner as per the provision of Section-10 (d) of Indian Telegraph Act, 1885
1.4	The Right to Information Act, 2005	Applicable. Designated authorities to be in place.	The required mechanism to comply with the provisions of the act including designated officers at various levels are already in place in TSECL
1.5	Indian Treasure Trove Act, 1878 as amended in 1949	Not Applicable. No such instances reported in instant case till date.	Moreover, very less possibilities of such discoveries because of limited and shallow excavations
2. World Bank Operational Policy			
2.1	OP 4.12 – Involuntary Resettlement	Not applicable as there is no involuntary acquisition invoked for securing land for proposed S/S.	Not Required.
2.2	OP 4.10– Indigenous Peoples	Explicit consent from ADC and the Village Councils is required in the case of acquisition of lands which is not applicable in the project.	Complied with: NoC of from village councils (Head man, Gram Burrah) and land owners being obtained for community forest land/ADC area wherever applicable.
2.3	Managing the risks of adverse impacts on communities from temporary project induced labor influx	Applicable. However, the labours are appointed from local area and are nonresidential. Hence Impacts expected are very temporary and low in intensity	Complied. Guiding principles and recommendations are considered during labour appointment through construction contractor

3.5 Necessary Statutory Permission/Licenses/NOC Obtained in the Instant Case

The applicability of acts, notifications and policies have already been described in above paragraphs and table. As per the applicability, necessary permission/ licenses/ NOC so far to be obtained / are obtained by IA or contractor are:

- The project has initiated the process of obtaining required clearances from Railway Department. Under the provisions of Section 68(1) of Electricity Act, 2003, prior approval GoT is a mandatory requirement to undertake any new transmission project in the State. As a part of permission / approval, GoI approved the NERPSIP comprehensive scheme for six North Eastern States including Tripura under vide its Office Memorandum dated 1st December 2014.
- All the contractors have obtained and operating the construction work with valid labor license as per provision under section – 12(1) of the Contract Labor (Regulation & Abolition) Act, 1970 and also certified under Section- 7(3) of the Building and Other Construction Workers (Regulation of Employment and Condition of Service) Act, 1996 from Ministry of Labor & Employment. The same are discussed and presented in relevant sections of subsequent chapters.
- All the contractors have obtained requisite insurance policy as per provisions of Employee Compensation Act, 1923 for its employed workforce. The same are discussed and presented in relevant sections of subsequent chapters.
- Since the tower locations are coming under various villages of 3 districts NoC from concerned land owner/ Headman /Village Council are being obtained as per the progress of work. The same are referred and presented in relevant sections of subsequent chapters.
- The proposed TL Kailasahar- Dharmanagar 132 KV D/C line is having Forest area of 14.386 Ha of RF. S Stage-I & Stage-II (final) approval obtained on 10th April 18 & 07th June 19 respectively. **Please Refer Annexure 5 for Forest clearance obtained.**
- Proposed DL 132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line involve 0.9973 Ha of RF. Stage-I clearance issued on 2nd March 2021 and Working permission obtained on 10th May 2021. **Please Refer Annexure 5 for Forest clearance obtained.**
- 33 kV Jawaharnagar - Dhumachera line- Stage-I issued on 28.06.2021. CA, NPV deposited. Working permission obtained on 29.09.21. It is not included in instant FEAR as no survey is done on site and no data is available. However, the study is presented in Addendum I as per suggestion of WB because the line details are received in November 2021.
- It is mandatory to do the compensatory afforestation as per the forest clearances obtained for the project. As per specific conditions in Forest Clearance obtained from MoEFCC, the compensatory afforestation is to be carried out on double the degraded forest area as suggested and identified by forest department. POWERGRID has paid the requisite cost as per prescribed law for the compensatory afforestation (CAMPA) to Forest department. It may also be noted that the user agency/ IA has no role in taking compensatory afforestation activity except deposition of CA cost to forest dept/CAMPA rather it is the forest dept responsibility to undertake the plantation as per CA scheme.

4. MAJOR FEATURE OF FINAL ROUTE/ENVIRONMENT IMPACT

4.1 Introduction

Environmental impact of T&D line projects is not far reaching and are mostly localized to RoW. However, T&D project has some effects on natural and socio-culture resources. These impacts can be minimized by careful route selection. To minimize these possible impacts, TSECL & IA at the system planning stage itself try to avoid ecological sensitive areas like forest. Wherever such infringements are substantial, different alternative options are considered to select most viable route alignment. For further optimization of route modern survey techniques/tools like GIS, GPS aerial photography is also applied. Introduction of GIS and GPS in route selection result in access to updated/latest information, through satellite images and further optimization of route having minimal environmental impact. Moreover, availability of various details, constraints like topographical and geotechnical details, forest and environmental details etc. help in planning the effective mitigate measures including engineering variations depending upon the site situation/location.

At the system planning stage itself one of the factors that govern the evolution of system is the possible infringement with the forest. Wherever such infringements are substantial, different alternative options are considered.

While identifying the transmission system, preliminary route selection is done by TSECL based on the Survey of India Topo sheets, Forest Atlas (GoI Publication) and Google Maps etc. During route alignment all possible efforts are made to avoid the forest area involvement completely or to keep it to the barest minimum, whenever it becomes unavoidable due to the geography of terrain or heavy cost involved in avoiding it. Presence of important/protected natural habitats (IUCN category I - IV) is verified by superimposing the proposed alternative alignment on the Integrated Biodiversity Assessment Tool (IBAT) map. The route/site selection criteria followed is detailed below in the ensuing paragraphs.

4.2 Environmental Criteria for Route Selection

For selection of optimum route, the following points are taken into consideration:

- The route of the proposed TLs does not involve any human rehabilitation
- Any monument of cultural or historical importance is not affected by the route of the TL.
- The proposed route of TL does not create any threat to the survival of any community with special reference to Tribal Community.
- The proposed route of TL does not affect any public utility services like playgrounds, schools, other establishments etc.
- The line route does not pass through any National Parks, Sanctuaries etc.
- The line route does not infringe with area of natural resources.

In order to achieve this, TSECL undertakes route selection for individual TLS in close consultation with representatives of concerned Forest Department and the Department of Revenue. Although under the law, TSECL has right of eminent domain yet alternative alignments are considered keeping in mind the above-mentioned factors during site selection, with minor alterations often added to avoid environmentally sensitive areas and settlements at execution stage.

- As a rule, alignments are generally cited away from major towns, whenever possible, to account for future urban expansion.
- Similarly, forests are avoided to the extent possible, and when it is not possible, a route is selected in consultation with the local Divisional Forest Officer, that causes minimum damage to existing forest resources.
- Alignments are selected to avoid wetlands and unstable areas for both financial and environmental reasons.

In addition, care is also taken to avoid NP, WLS, ESZ, Tiger reserves, Biosphere reserves, Elephant passage / corridors and IBA sites etc. Keeping above in mind the routes of proposed lines under the project have been so aligned that it takes care of above factors. As such different alternatives for TLs were studied with the help of Govt. published data like Forest atlas, Survey of India and Google Maps etc. to arrive at most optimum route which can be taken up for detailed survey and assessment of environmental & social impacts for their proper management.

Similarly, the TOR for detailed survey using modern tool like GIS/GPS also contained parameters to avoid/reduce environmental impact while deciding the final route alignment. The major objectives for detailed survey that are part of contract are summarized below:

- i. The alignment of TL shall be most economical from the point of view of construction and maintenance.
- ii. Routing of TL through protected and reserved forest area should be avoided. In case it is not possible to avoid the forest or areas having large trees completely then keeping in view of the overall economy, the route should be aligned in such a way that cutting of trees is minimum.
- iii. The route should have minimum crossing of major rivers, railway lines, and national/state highways, overhead EHP power lines and communication lines.
- iv. The number of angle point shall be kept to a minimum
- v. The distance between the terminal points specified shall be kept shortest possible, consistent with the terrain that is encountered
- vi. Marshy and low line areas, river beds and earth slip zones shall be avoided to minimum risk to the foundations
- vii. It would be preferable to utilize level ground for the alignment.
- viii. Crossing of power line shall be minimal. Alignment is kept at a minimum distance of 300 meters from power lines to avoid induction problems on the lower voltage lines.
- ix. Crossings of communication lines shall be minimized and it shall be preferably at right angle, proximity and paralyses with telecom lines shall be eliminated to avoid danger of induction to them.
- x. Area subjected to flooding searches streams shall be avoided.
- xi. Restricted areas such as civil and military airfield shall be avoided. Care shall also be taken to avoid the aircraft landing approaches
- xii. All alignment should be easily accessible both in dry and rainy seasons to enable maintenance throughout the year.
- xiii. Certain areas such as query sites, tea, tobacco and saffron fields and rich plantation, gardens and nurseries that will present the owner problems in of right of way and leave clearance during construction and maintenance should be avoided.
- xiv. Angle point should be selected such that shifting of the point within 100 m radius is possible at the time of construction of the line.
- xv. The line routing should avoid large habitation densely populated areas to the extent possible.
- xvi. The area requires special foundations and those prone to flooding should be avoided.

- xvii. For examination of the alternatives and identification of the most appropriate route, besides making use of information/data/details available/extracted through survey of India topographical maps and computer aided processing of NRSA satellite imagery, the contractor shall also carry out reconnaissance / preliminary survey as may be required for the verification and collection of additional information/data/details.
- xviii. The contractor shall submit his preliminary observation and suggestion along with various information/data/details collected and also processed satellite imagery data, topographical map data marked with alternative routes etc. The final evaluation of the alternative routes shall be conducted by the contractor in consultation with owners' representatives and optimal route alignment shall be proposed by the contractor. Digital terrain modeling using contour data from topographical maps as well as processed satellite data shall be done by the contractor for the selected route. A flythrough perspective using suitable software(s) shall be developed or further refinement of the selected route. If required site visit and field verification shall be conducted by the contractor jointly with the owners' representatives for the proposed route alignment
- xix. Final digitized route alignment drawing with the latest topographical and other details / features including all river railway lines, canals, roads etc. up to 8 Kms on both side of selected route alignment shall be submitted by the contractors for owner's approval along with report containing other information / details as mentioned above

4.2.1 Evaluation of Alternative Route Alignment for Proposed Transmission Lines

In the instant project, criteria for route selection as mentioned above, has been duly adhered to. The proposed TL Kailasahar- Dharmanagar 132 KV D/C line has been selected from three (3) different alignments as described in IEAR. TL earlier was passing through rich vegetation and forest cover of near to Rowa WLS. Three alignment alternatives were studied with the help Google Maps and walkover survey to arrive at most optimum route for detailed survey. This was then verified on web-based IBAT Database. The images are Provided in **Annexure 4**. The final route was considered for the further detailed surveys and primary data collection. Subsequently, the proposed TL route was considered for detail route survey by Contractor Agency (after awarding of contract) and Environmental Consultant. During detailed survey minor alterations as well as geometrical corrections of the route have been carried out which seems inevitable due to actual ground conditions with prime objective of avoiding dense forest/private plantation areas, Common Property Resource (CPR), and also considering the technical feasibility of the route from operation and maintenance point of view in consultation with the local village councils prevalent in the project area. Therefore, minor change in scope of work has been observed with respect to IEAR scope which resulted due to the best effort of TSECL in effectively integrating safeguard and engineering measures in successful minimization of impact on forest and environment. The proposed TL Kailasahar- Dharmanagar 132 KV D/C line was earlier passing at 1.5 km from Rowa WLS. After detailed route analysis, and meticulous study final alignment is now passing at 4.8 km from Rowa WLS boundary. **Please refer Annexure 3.**

4.2.2 Evaluation of Alternative Route Alignment for Proposed Distribution Lines

In the present FEAR II, 5 DLs are studied (as mentioned in Section 1.5). The three alternative alignment analysis is carried out for the proposed **DL 132/33 kV Manu (New) - 33/11kV 82 Mile (new) 33 KV** line. The images are Provided in **Annexure 4**. The rest DLs connect two S/S in near vicinity and have a line length of less than 10 kms, thus, having limited environmental and social impacts. Hence these remaining lines are considered for the alternative analysis.

Subsequently, the proposed DL routes were considered for detail survey by Contractor Agency and Environmental consultant (after awarding of contract). During detailed survey minor alterations as well as geometrical corrections of the route have been carried out which seems inevitable due to actual ground conditions with prime objective of avoiding dense forest/private plantation areas, settlements, CPR, and also considering the technical feasibility of the route from operation and maintenance point of view in consultation with the local prevalent in the project area. Therefore, minor change in scope of work has been observed with respect to IEAR scope which resulted due to the best effort of IA/TSECL in effectively integrating safeguard and engineering measures in successful minimization of environmental and social impacts.

4.2.3 Evaluation of Alternatives for Proposed Substations

For sub-station, site selection analysis of 2-3 alternatives sites is usually carried out based on environment and social aspects and technical requirement. Such analysis considers various site-specific parameters that include availability of infrastructure facilities such as access roads, water, distance from railheads, type of land (Government / revenue/ private land); social impacts such as number of families getting affected; CPR including feasibility of acquisition. It may be noted that in the instant case land parcels for all the proposed S/S are already in possession with TSECL and no fresh land is required to be acquired and therefore, the said exercise is not required/needed for proposed project.

4.2.4 Change in Scope of Work w.r.t. IEAR

For changes in scope of work with respect to IEAR scope i.e., changes in the route alignment based upon alternatives studies and detailed survey for T&D line carried out on field is given in **Table 4.1**

Table 4-1: Change in Scope of Work w.r.t IEAR

Sr. No.	Details of Power Line / Substation	Change in Length of Power Lines (Km)/ Location of substation		Reason / Justification for change in scope of work
		As per IEAR	Final Route / Location	
A.	Transmission Line Network			
1	Kailasahar- Dharmanagar 132 kV D/C line	22	21.916	To avoid forest land / PA / habitation and structures
2	LILO of 132kV Ambassa – PK Bari line at Manu S/S	0.5	1.175	
3	132 KV Interconnection from old Manu S/S to New Manu S/s at Chauwmanu	-	3.31	Newly Added for charging at 132 KV S/C Manu to Chawmanu
B.	Distribution Line Network			

Sr. No.	Details of Power Line / Substation	Change in Length of Power Lines (Km)/ Location of substation		Reason / Justification for change in scope of work
		As per IEAR	Final Route / Location	
1	132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line	5	5.186	Line alignment changed. Earlier no forest was involved. Due to diversion of line route for NH expansion some forest stretches were unavoidable. 0.99 Ha of RF land is affected due to this the DL
2	DL 33 kV Jawaharnagar – Dhumachhera*	23	23	No Change
3	132/33 kV Manu (New) - 33/11 kV Dhumachhera (New) 33kV line	3.5	6.628	To avoid forest land / habitation and structures
4	132/33 kV Manu (New) - 33/11kV 82 Mile (new) 33 kV line	13	15.192	
5	132/33 kV P K Bari (Existing) -33/11 kV 82 Mile (New) 33 kV line	4.5	8.094	
6	33/11kV Chailengta (New) – LILO point of Chamanu-Manu Line	4	1.829	
C. Substations				
1.	Extension of 132/33 kV at Kailasahar	Unchanged TSECL Own Land		
2.	Extension of 132/33 KV S/S at Dharmanagar	Unchanged TSECL Own Land		
3.	Establishment of 2 x 50 MVA, 132/33 kV new S/S at Manu	Unchanged TSECL Own Land		
4.	Augmentation of 132/33 KV S/S at Ambassa.	Unchanged TSECL Own Land		
5.	Establishment of 2x5 MVA, 33/11 kV new S/S at Jawahar Nagar	Unchanged TSECL Own Land		
6.	Establishment of 2x5 MVA, 33/11 kV new S/S at Dhumachhera	Unchanged TSECL Own Land		
7.	Establishment of 2x5 MVA, 33/11 kV new S/S at 82 Mile	Unchanged TSECL Own Land		
8.	Establishment of 2x5 MVA, 33/11 kV new S/S at Tilla Bazar	Unchanged TSECL Own Land		
9.	Establishment of 2x5 MVA, 33/11 kV new S/S at Durgachowmohni	Unchanged TSECL Own Land		
10.	Establishment of 33/11 KV S/S at Chailengta	Unchanged TSECL Own Land		

*Presented in Addendum I as per suggestion of WB because the line details are received in November 2021.

4.3 Features and Satellite Images of T&D Lines

4.3.1 Transmission Lines (TLs)

4.3.1.1 Feature Details of Final Route Alignment of Kailasahar- Dharmanagar 132 kV D/C TL

Kailasahar- Dharmanagar 132 kV D/C TL covers 21.916 km distance. Total 81 transmission tower (TT) are proposed in this TL. The TL is finalized after detailed analysis considering the environmental features like Forest / PA / River etc. The feature survey along the TL is carried out considering 27 mt ROW width i.e., 13.5 mt on either side from center line of the corridor. Geomorphological studies observed that the geology of project area is majorly having primary

rock structure of moderate valley fill and moderately dissected structurally hills. Rock type comprises of shaly sandstone along with Shale with sandstone/ limestone bands and Alluvium-sand/ silt & clay alternating beds.

Major part of the TL passes through plain agricultural fields (46.20%), open hill forest (18.76%) and Rubber Plantation (15%). The TL do not cross any National Highway and Power line. However, TL crosses Railway track between TT 28 and 29 and Bridge. Other than agriculture, this line traverses through fallow land, metal roads, tree crops and groves, pond / lake, river etc. The TL routes involve RF land of about 14.3586 Ha of RF area which has needed forest clearance under Forest (Conservation) Act, 1980. Stage I and Stage II approval is obtained as on 10th April 2018 and 07th June 2019 respectively. Besides all PA like NP, WLS and designated wildlife / elephant passage have been completely avoided. The landslide study during electric line feature survey and GIS mapping, reveals that the project region is highly vulnerable to landslide at some places and not vulnerable to landslide at some places of the alignment. The details are Depicted in **Annexure B1**. The project TL is passing through the area of vulnerable to flood. The type of hazard for the project site is recorded as earthquake, windstorm and Flood and landslide.

As per detailed surveys and GIS imagery data ROW is crossing water bodies such as river, pond, drain & nala. TL is crossing Pabhi Chhara between TT 14 and 15 and drain between 30 and 31. TL is Crossing Juri River between TT 27 and 28. TT constructed well above the ground level at required elevation to keep the people and animals away from EMF contact. It also prevents the structure getting damaged during flood situation. All the tower locations are easily accessible through existing road to carryout construction and maintenance activity.

GIS route survey map and TL feature details are provided in **Annexure A1 & B1**. The major feature details are depicted in **Table 4.2**. The Google earth image of TL is provided in the **Map 4.1**.

Table 4-2: Kailasahar – Dharmanagar 132 kV D/C

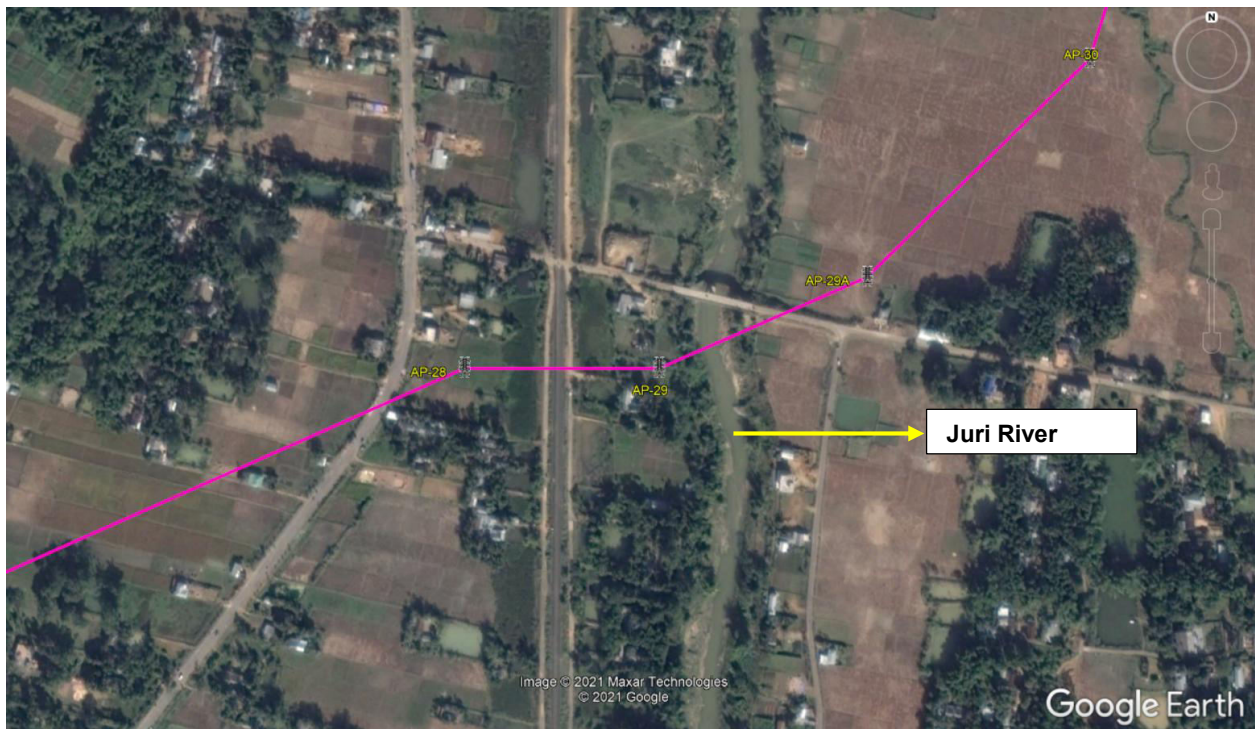
Electric Line Feature Details -27m ROW

Feature Class Details	Area In Ha.	% Of Area
Electric Substation	2.35	3.84%
Agriculture Land	28.29	46.20%
Open Hill Forest	11.49	18.76%
Tree Crop and Groves	2.56	4.18%
Metal Road	0.60	0.98%
Mud Road	0.34	0.56%
Vacant Land	0.68	1.11%
Waste Land	1.35	2.21%
Pond/Lake	1.89	3.09%
Bricks Road	0.17	0.28%
Barren/Rocky	1.45	2.36%
Rubber Plantation	9.12	14.90%
Wet Land	0.17	0.27%
Drain/Nala	0.42	0.69%
Bricks Kilns/Quarry	0.21	0.35%
Railway	0.06	0.10%
River	0.07	0.12%
Bridge	0.001	0.002%
Total	61.24	100%

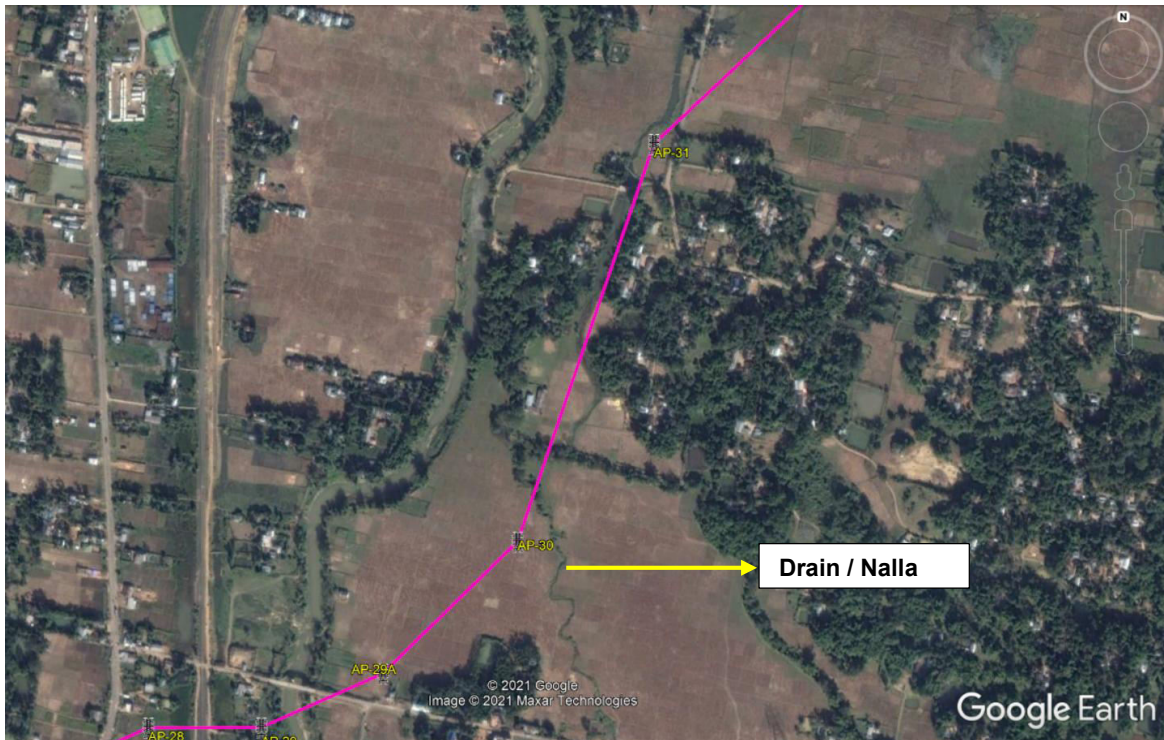
Photographs of the site location are given below:



TL is crossing Pabhi Chhara River between TT 14 and 15



TL is Crossing Juri River between TT 27 and 28



TL is Crossing Drain / Nalla between TT 30 and 31



TL crossing Agriculture Land



TL Crossing Raiway Line and Bridge



Transmission Line Route



TL Crossing Metal Road



TL Crossing Tree crops



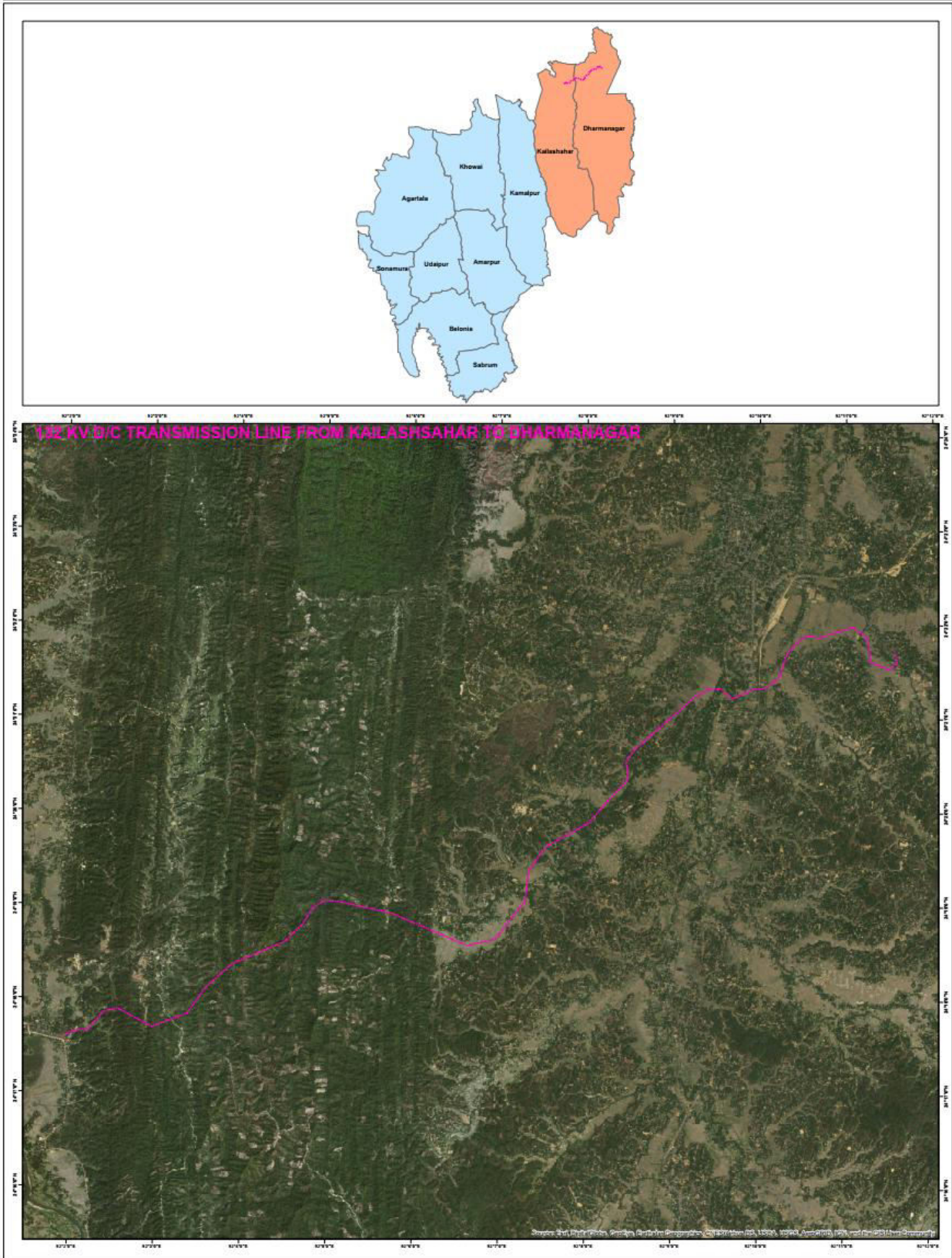
Dharmanagar Electric S/S



Kailasahar Electric S/S

Map 4-1: Google Earth Alignment Map for 132 kV D/C Kailasahar – Dharmanagar TL

LOCATION MAP OF 132 KV D/C TRANSMISSION LINE FROM KAILASHSAHAR TO DHARMANAGAR
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED (NERPSIP)
PREPARED BY GREEN CIRCLE INC,



4.3.1.2 Feature Details of Final Route Alignment of LILO of 132 kV Ambassa – PK Bari TL at Manu S/S

LILO of 132 kV Ambassa – PK Bari TL at Manu S/S covers 1.175 km distance. Total 8 TT are proposed in this TL. The TL is finalized after detailed analysis considering the environmental features like forest / PA / river etc. The feature survey along the TL is carried out considering 27 mt ROW width i.e., 13.5 mt on either side from center line of the corridor. Geomorphological studies observed that the geology of project area is majorly having primary rock structure of less dissected denudational hills. Rock type comprises of Shaly sandstone.

Major part of the TL passes through plain Rubber Plantation (90.64%) and Waste Land (9.36%). The TL do not cross any National Highway, Railway and Power line. The TL routes do not involve RF land which do not necessitate forest clearance under Forest (Conservation) Act, 1980. Besides all protected areas like NP, WLS and designated wildlife / elephant passage have been completely avoided. The landslide study during electric line feature survey and GIS mapping, reveals that the project region is moderately vulnerable to landslide. The details are Depicted in **Annexure B2**. The project line is passing through the area which is not vulnerable to flood. The type of hazard for the project line is recorded as earthquake and landslide.

As per detailed surveys and GIS imagery data ROW is not crossing any water bodies such as river, pond, drain & nala. TT constructed well above the ground level at required elevation to keep the people and animals away from EMF contact. It also prevents the structure getting damaged during flood situation. All the tower locations are easily accessible through existing road to carryout construction and maintenance activity.

GIS route survey map and TL feature details are provided in **Annexure A2 & B2**. The major feature details are depicted in **Table 4.3**. The Google earth image of TL is provided in the **Map 4.2**.

Table 4-3: LILO of 132 kV Ambassa – PK Bari line

Electric Line Feature details-35m ROW

Feature Class Details	Area In Ha.	% Of Area
Rubber Plantation	0.85	90.64%
Waste Land	0.09	9.36%
Total	0.94	100

Photographs of the site location are given below:



Substation Construction at Manu



Stringing LOC PK Bari Ambassa

Map 4-2: Google Earth Alignment Map for LILO of 132 kV Ambassa – PK Bari TL

LOCATION MAP OF 132 KV D/C PK. BARI AMBASSA TRANSMISSION LINE TAPING ARRANGMENT FOR LILO AT MANU S/S
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED (NERPSIP)
PREPARED BY GREEN CIRCLE INC,



4.3.2 Distribution Line (DLs)

4.3.2.1 Feature Details of Final Route Alignment of 33 kV DL from 132/33 kV Ambassa (Existing) to 33/11 kV Jawahar Nagar (New)

33 kV DL from 132/33 kV Ambassa (Existing) to 33/11 kV Jawahar Nagar (New) covers 5.186 km distance. Total 192 electric pole (EP) are proposed in this DL. The DL is finalized after detailed analysis considering the environmental features like Forest / PA / River etc. The feature survey along the TL is carried out considering 15 mt ROW width i.e., 7.5 mt on either side from center line of the corridor. Geomorphological studies observed that the geology of project area is majorly having primary rock structure of Less dissected Denudational Hills, Moderate Valley Fill and moderately dissected structurally hills. Rock type comprises shaly sandstone along with Alluvium-sand/ silt & clay alternating beds and Sandstone/ pebble bed/ conglomerate.

Major part of the TL passes through plain agricultural fields (11.40%), open forest (15%), waste land (10.43%) and Tree Crops and Groves (11.45%). The DL do not cross any National Highway, Railway and Power line. However, DL crosses brick kilns / quarry, metal roads, pond / lake etc. The DL route involves RF land of about 0.9972 Ha area which has necessitated forest clearance under Forest (Conservation) Act, 1980. Stage I approval is obtained on 2nd March 2021 and Working permission obtained on 10th May 2021 Besides all PA like NP, WLS and designated wildlife / elephant passage have been completely avoided. The landslide study during electric line feature survey and GIS mapping, reveals that the project region is very less or not vulnerable to landslide. The project area is not vulnerable to flood. The details are Depicted in **Annexure B3**. The type of hazard for the project line is recorded as earthquake, windstorm and low landslide.

As per detailed surveys and GIS imagery data ROW crosses water bodies such as river, pond. DL crosses river Dhalai between EP 14 and 15. EP 37 and 60 are coming near water pond. All EPs are planned along the existing road side / metal road. As all the pole locations are easily accessible through existing road to carryout construction and maintenance activity. EPs are constructed well above the ground level at required elevation helps to keep the people and animals away from EMF contact. It also prevents the structure getting damaged during flood situation.

GIS route survey map and TL feature details are provided in **Annexure A3 & B3**. The major feature details are depicted in **Table 4.4**. The Google earth image of DL is provided in the **Map 4.3**.

Table 4-4: 33 kV line from 132/33 kV Ambassa (Existing) to 33/11 kV Jawahar Nagar (New)

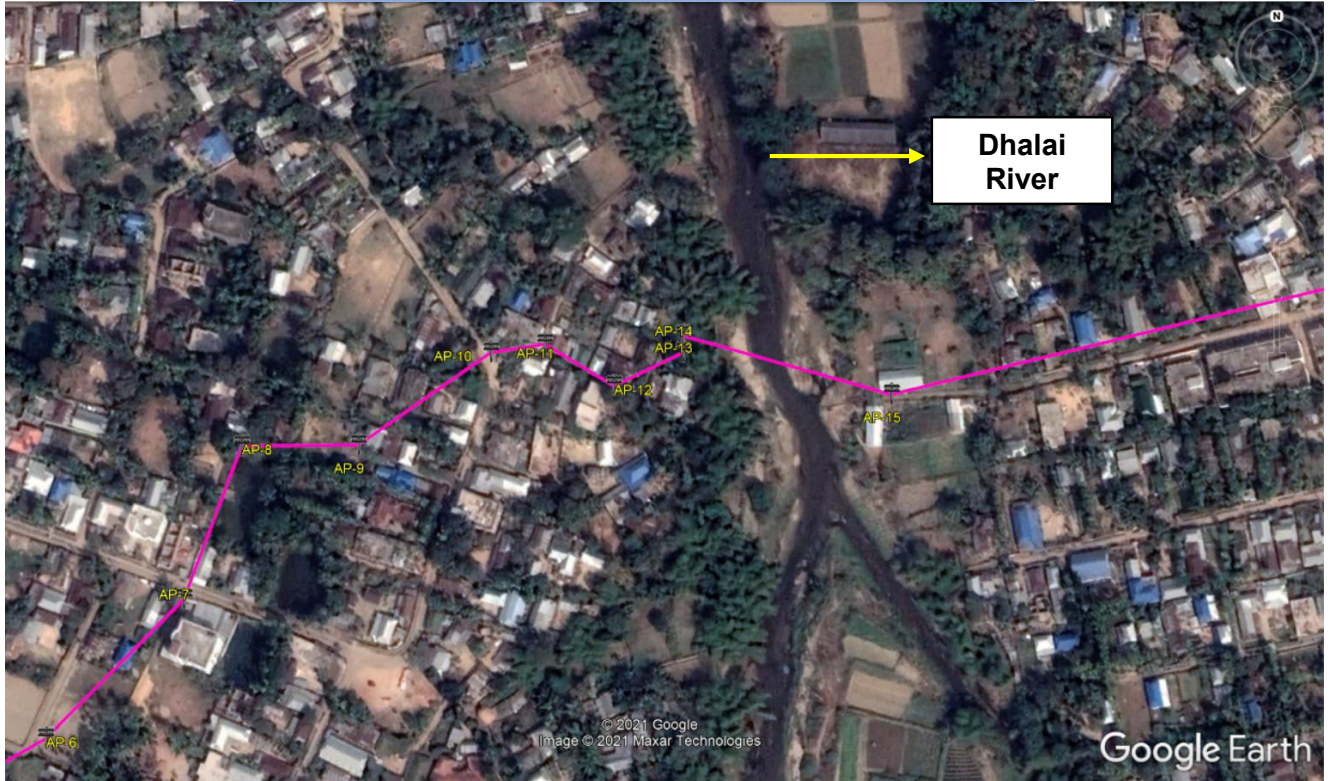
Electric Line Feature Details-15m ROW

Feature Class Details	Area In Ha.	% Of Area
Electric Substation	0.74	6.87%
Mud Road	1.51	14.02%
Waste Land	1.12	10.43%
Metal Road	0.68	6.28%
Bricks Road	0.12	1.15%
Vacant Land	1.84	17.11%
Agriculture Land	1.23	11.40%
Tree Crop and Groves	1.23	11.45%

Photographs location are

of the site given below:

River	0.12	1.11%
Brick Kilns/Quarry	0.43	3.96%
Pond/Lake	0.13	1.17%
Open Forest	1.62	15.05%
Total	10.77	100%



DL Crossing Dhalai River Between EP 14 and 15



Pole Location along Metal Road



Jawahar Nagar S/S construction site

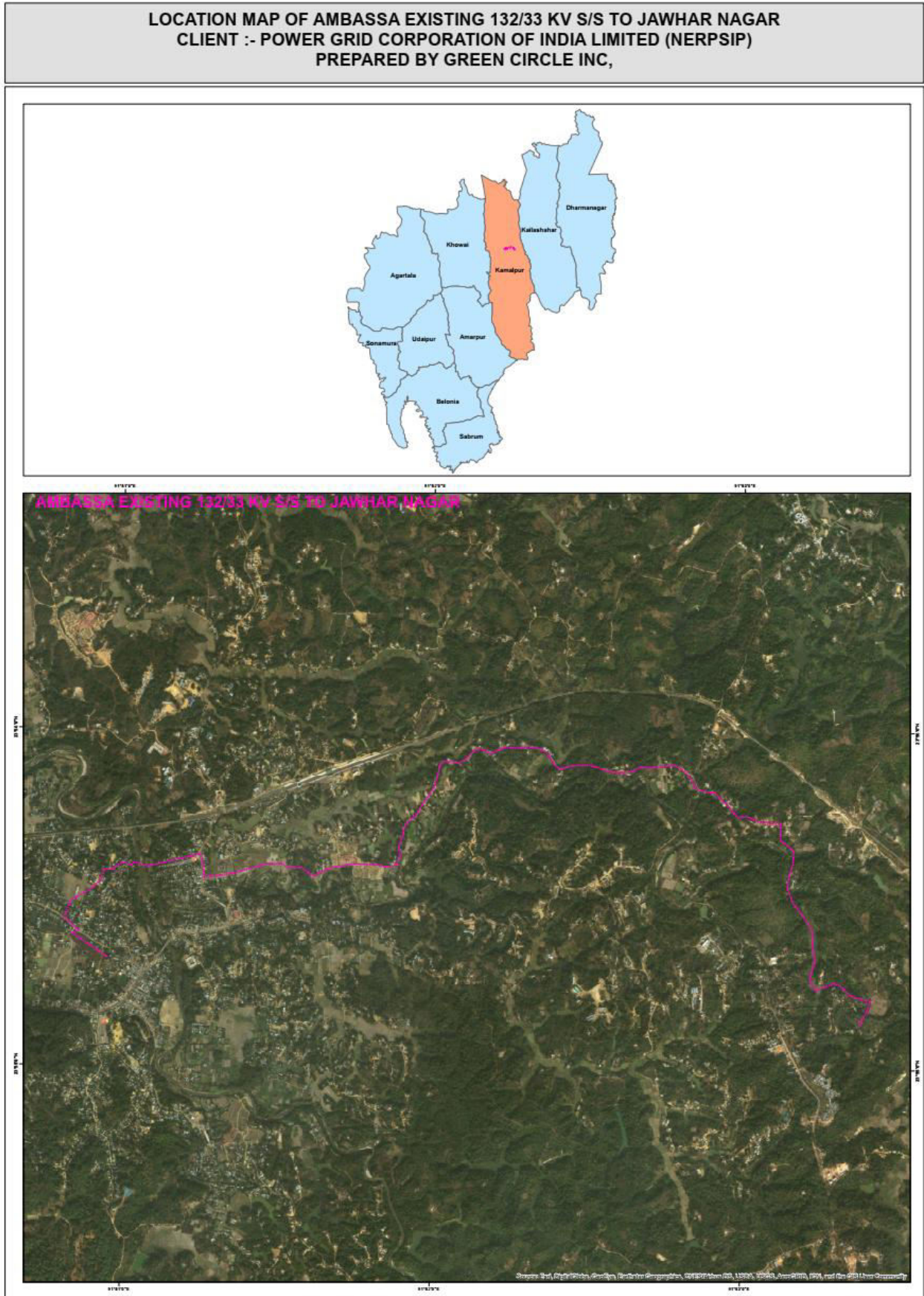


DL Line - Other Building



DL Line - Market place

Map 4-3: Google Earth Alignment Map of Ambassa (Existing) to 33/11 kV Jawhar Nagar (New)



4.3.2.2 Feature Details of Final Route Alignment of 33/11 kV DL from Manu (New)-33/11kV Dhumachhera (New) 33 kV

33/11 kV DL from Manu (New)-33/11kV Dhumachhera (New) 33 kV covers 6.628 km distance. Total 248 electric pole (EP) are proposed in this DL. The DL is finalized after detailed analysis considering the environmental features like Forest / PA / River etc. The feature survey along the TL is carried out considering 15 mt ROW width i.e., 7.5 mt on either side from center line of the corridor. Geomorphological studies observed that the geology of project area is majorly having rock structure of less dissected denudational hills and moderate valley fill. Rock type comprises of shaly sandstone.

Major part of the TL passes through plain agricultural fields (20.32%), rubber plantation (44%) and Tree Crops and Groves (8.43%). Nearly half of the part of this line cross through rubber plantation and orchards between pole no. AP 1-4, 7-9, 11, 17-18, 23-26 followed by agricultural land between pole no. AP 19-22, 32-34. The DL do not cross any National Highway, Railway and Power line. However, DL crosses metal roads, pond / lake etc. The DL route do not involve RF land which do not necessitate forest clearance under Forest (Conservation) Act, 1980. Besides all PA like NP, WLS and designated wildlife / elephant passage have been completely avoided. The landslide study during electric line feature survey and GIS mapping, reveals that the project region is very less vulnerable to landslide. The project area is not vulnerable to flood. The details are Depicted in **Annexure B4**. The type of hazard for the project line is recorded as earthquake, windstorm and low landslide.

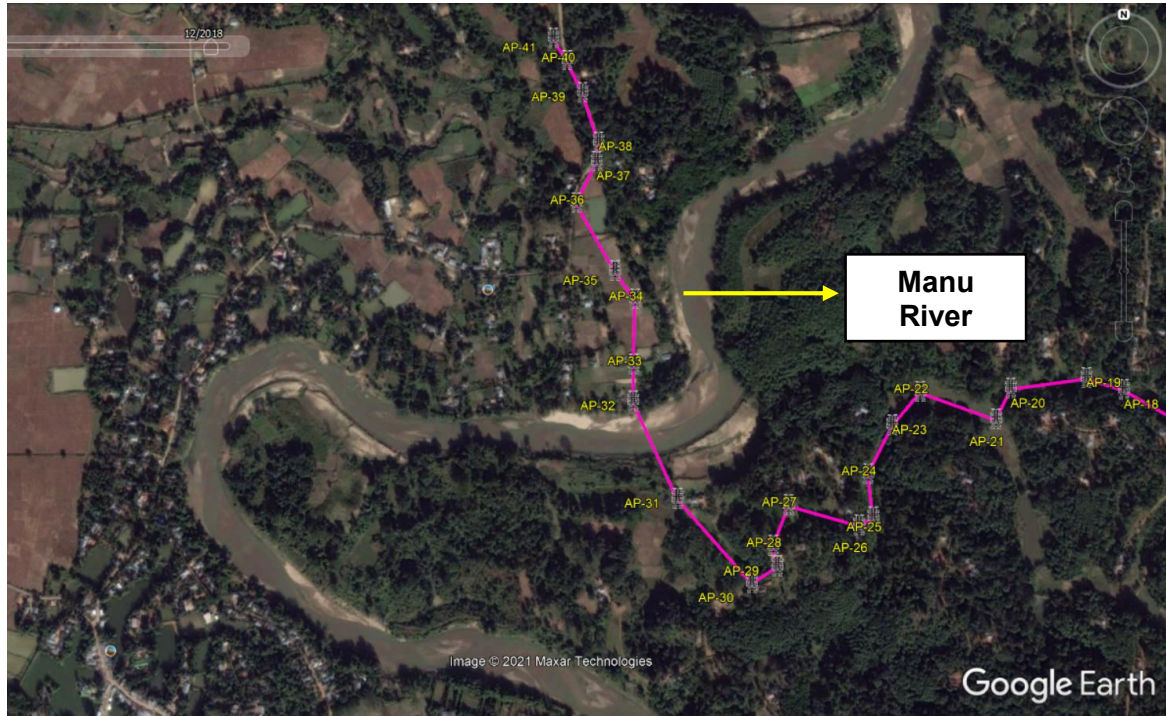
As per detailed surveys and GIS imagery data ROW crosses water bodies such as river, pond. DL crosses river Manu between EP 31 and 32. No EP coming near water pond. All EPs are planned along the existing road side / metal road. As all the pole locations are easily accessible through existing road to carryout construction and maintenance activity. EPs are constructed well above the ground level at required elevation helps to keep the people and animals away from EMF contact. It also prevents the structure getting damaged during flood situation.

GIS route survey map and TL feature details are provided in **Annexure A4 & B4**. The major feature details are depicted in **Table 4.5**. The Google earth image of DL is provided in the **Map 4.4**.

Table 4-5: 33/11 kV line from Manu (New)-33/11kV Dhumachhera (New)

Electric Line Feature Details - 15 mt ROW		
Feature Class Details	Area In Ha.	% Of Area
Rubber Plantation/Orchards	2.34	44.01%
Tree Crop and Groves	0.45	8.43%
Metal Road	0.54	10.12%
Waste Land	0.29	5.44%
Mud Road	0.08	1.46%
Vacant Land	0.28	5.36%
Pond/Lake	0.01	0.27%
River	0.11	2.00%
Bareen/Rocky with Scrub Land	0.14	2.60%
Agriculture Land	1.08	20.32%
Total	5.31	100%

Photographs of the site location are given below:



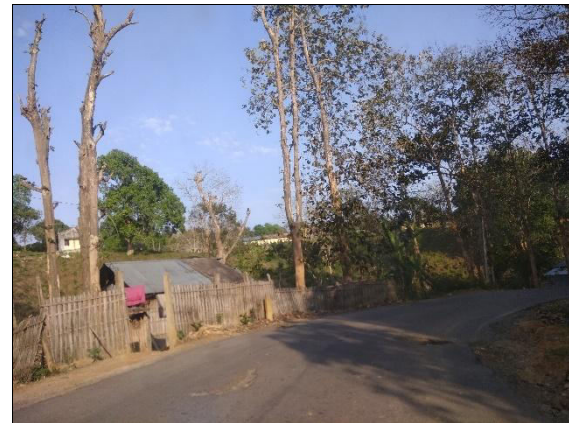
DL Crossing Manu River Between EP 31 and 32



DL Route - Trees/Crops



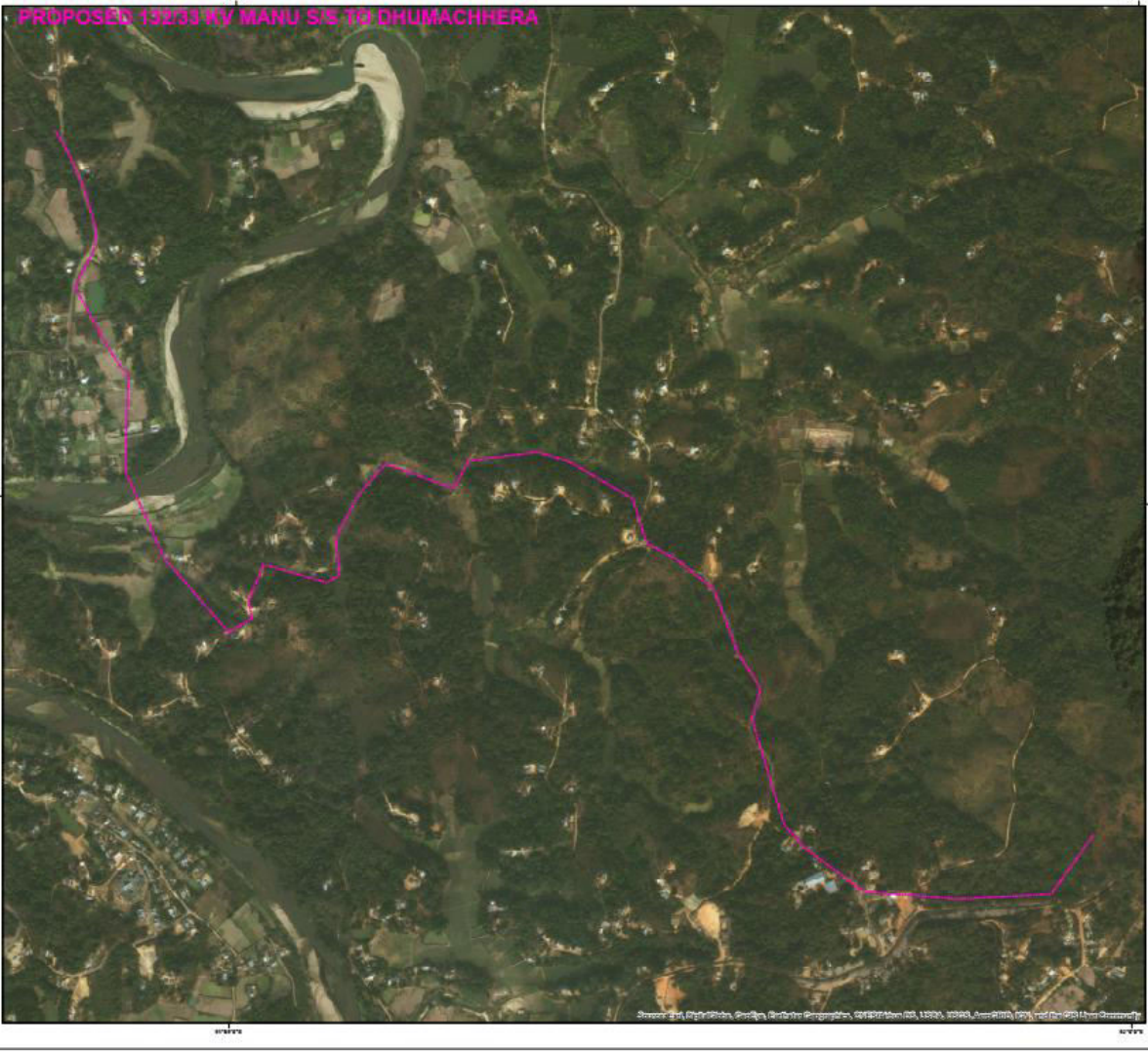
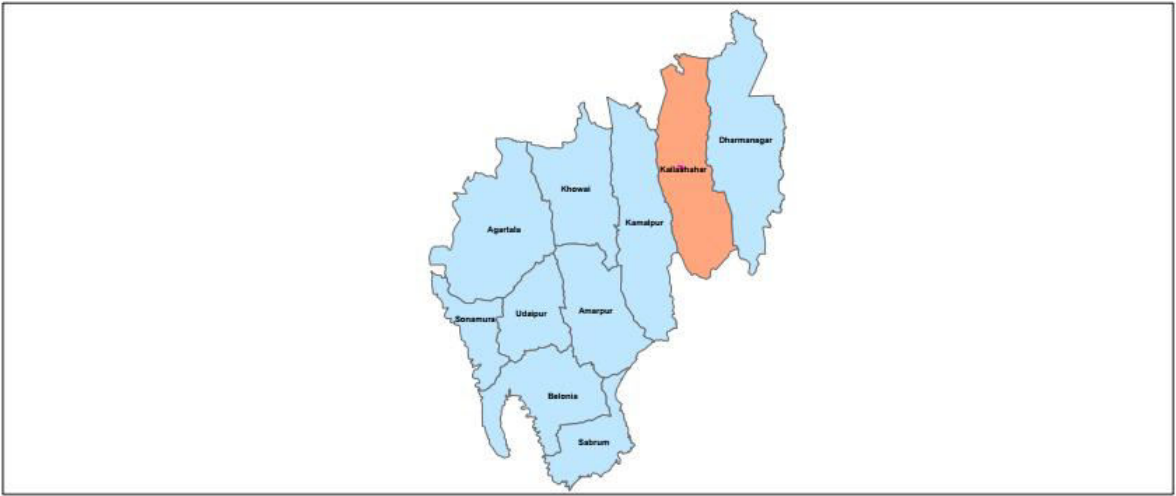
DL Route - Survey team member



DL Route - Metal Road

Map 4-4: Google Earth Alignment Map of 33/11 kV line from Manu (New)-33/11kV Dhumachhera (New)

LOCATION MAP OF PROPOSED 132/33 KV MANU S/S TO DHUMACHHERA
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



4.3.2.3 Feature Details of Final Route Alignment of 33 kV DL from 132/33 kV Manu (New) to 33/11 kV 82 mile (New)

33 kV DL from 132/33 kV Manu (New) to 33/11 kV 82 mile (New) covers 15.192 km distance. Total 430 EP are proposed in this DL. The DL is finalized after detailed analysis considering the environmental features like forest / PA / river etc. The feature survey along the TL is carried out considering 15 mt ROW width i.e., 7.5 mt on either side from center line of the corridor. Geomorphological studies observed that the geology of project area is majorly having primary rock structure of less dissected denudational hills. Rock type comprises of shaly sandstone.

Major part of the TL passes through plain agricultural fields (14%), tree crops and groves (12%) and Rubber Plantation (27%). Major part of this line passes from rubber plantation (pole no. AP 8-17, 41-42, 45-47, 69-75) followed by various trees and crops. The DL do not cross any National Highway and Power line. DL Crosses Railway line. Other than agriculture, this line traverses through fishing pond, metal roads, pond / lake, vacant lands, mud road, etc. The DL route do not involve RF land hence do not necessitate forest clearance under Forest (Conservation) Act, 1980. Besides all PA like NP, WLS and designated wildlife / elephant passage have been completely avoided. The landslide study during line feature survey and GIS mapping reveals that the project region is very low vulnerable to landslide. The project area is not vulnerable to flood. The details are Depicted in **Annexure B5**. The type of hazard for the project line is recorded as earthquake, windstorm, low landslide and Flood.

As per detailed surveys and GIS imagery data ROW crosses water bodies such as river, pond. DL crosses stream between EP 56 and 55 and Masti Chhara (tributary of Manu River) between EP 25 and 29. EP 65, 66, 67, 79 and 78 are planned in close proximity of water body. No EP coming near water pond. All EPs are planned along the existing road side / metal road. As all the pole locations are easily accessible through existing road to carryout construction and maintenance activity. EPs are constructed well above the ground level at required elevation helps to keep the people and animals away from EMF contact. It also prevents the structure getting damaged during flood situation.

GIS route survey map and DL feature details are provided in **Annexure A5 & B5**. The major feature details are depicted in **Table 4.6**. The Google earth image of DL is provided in the **Map 4.5**.

Table 4-6: 33 kV Line from 132/33 kV Manu (New) to 33/11 kV 82 mile (New)

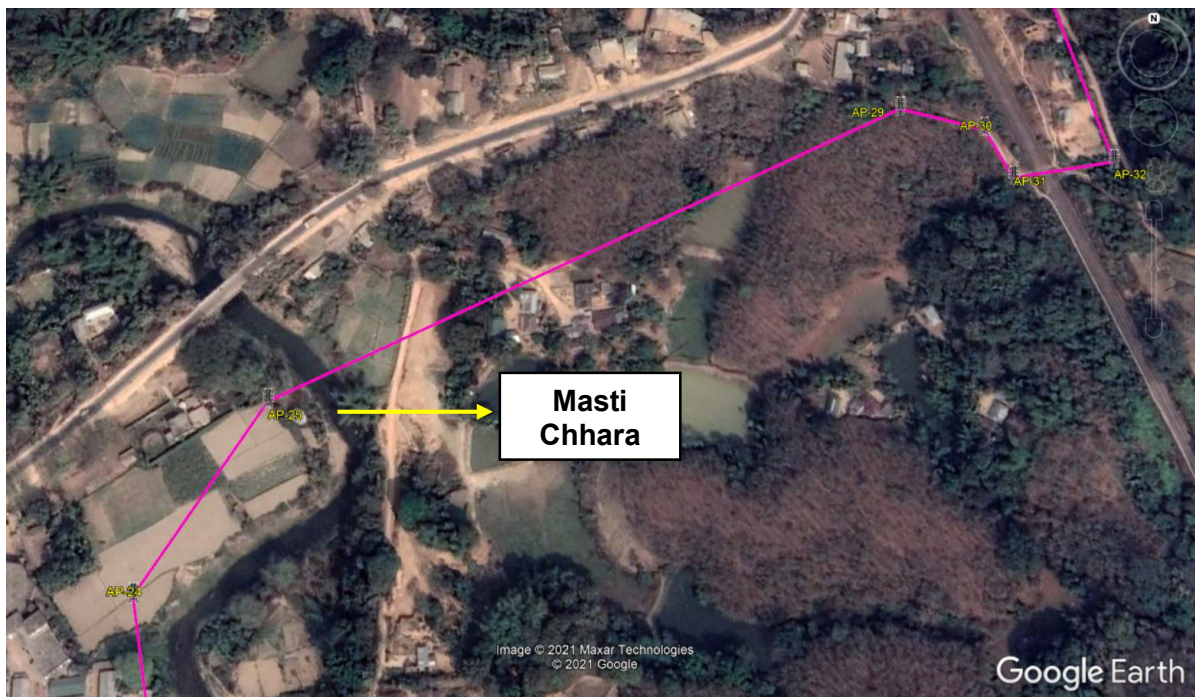
Electric Line Feature Details - 15m ROW		
Feature Class	Area in Ha.	% Of Area
Agriculture Land	2.38	14.26%
Barren Rocky with Scrub Land	1.62	9.71%
Bricks Road	0.20	1.19%
Electric Substation	0.22	1.30%
Fishing Pond	0.77	4.62%
Metal Road	0.92	5.50%
Mud Road	0.50	3.02%
Pineapple Garden	0.74	4.44%
Pond/Lake	0.11	0.67%
Railway	0.05	0.32%
River	0.05	0.32%
Rubber Plantation	4.54	27.24%
Tree Crop and Groves	1.99	11.91%

Feature Class	Area in Ha.	% Of Area
Vacant Land	1.67	10.01%
Waste Land	0.87	5.21%
Wetland	0.05	0.29%
Total	16.68	100 %

Photographs of the site location are given below:



DL Crossing Stream / Drain Between EP 55 and 56



DL Masti Chhara Between EP 25 and 29

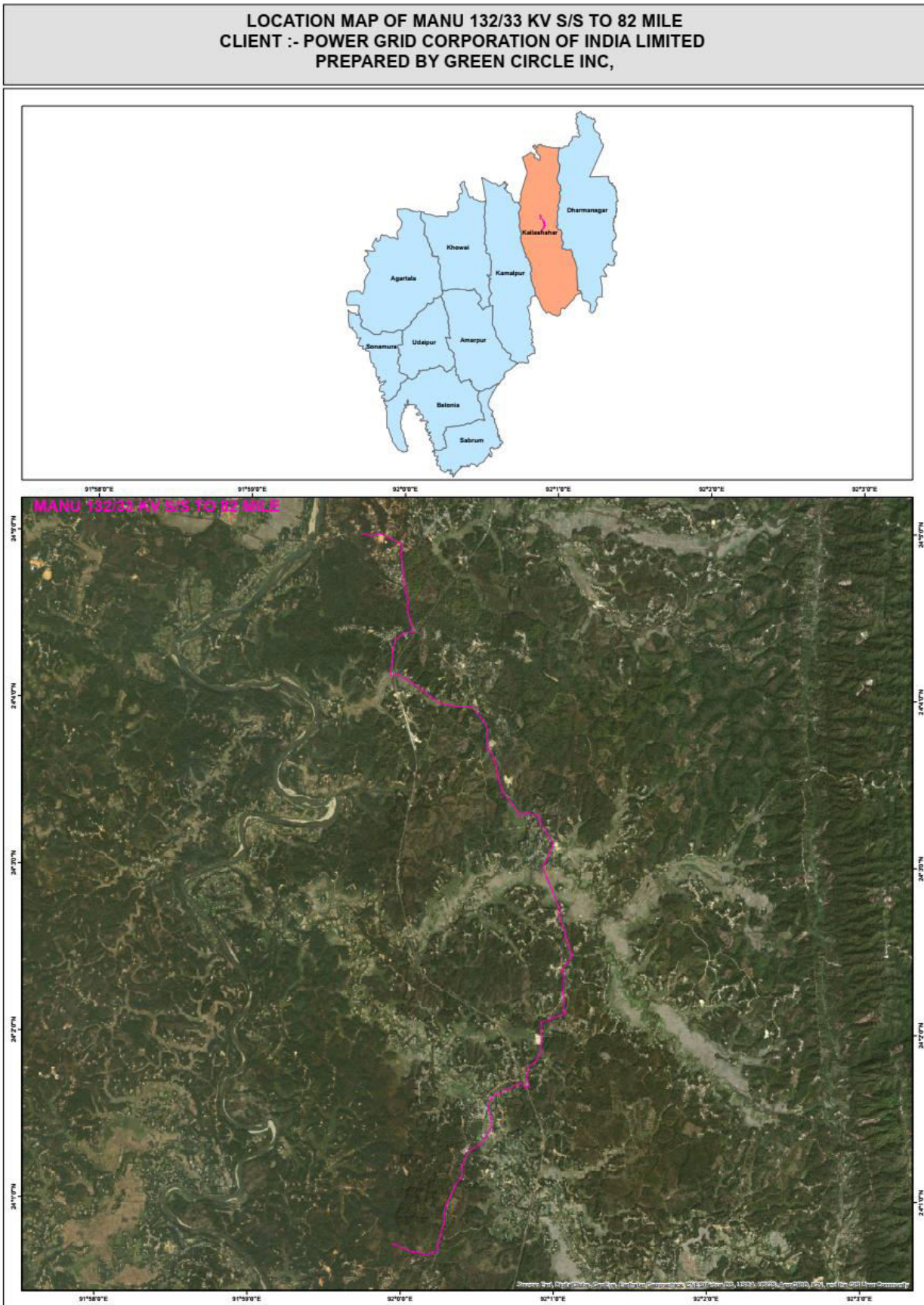


DL Section - Pole Location along Metal Road



DL Section - Pole Location/Market Area

Map 4-5: Google Earth Alignment Map of 33 kV Line from 132/33 kV Manu (New) to 33/11 kV 82 mile (New)



4.3.2.4 Feature Details of Final Route Alignment of 33 kV DL from 132/33 kV PK Bari (Existing) to 82 Mile (New) 33 kV DL

33 kV DL from 132/33 kV Manu (New) to 33/11 kV 82 mile (New) covers 8.094 km distance. Total 285 EP are proposed in this DL. The DL is finalized after detailed analysis considering the environmental features like forest / PA / river etc. The feature survey along the TL is carried out considering 15 mt ROW width i.e., 7.5 mt on either side from center line of the corridor. Geomorphological studies observed that the geology of project area is majorly having primary rock structure of less dissected denudational hills. Rock type comprises of shaly sandstone.

Major part of the TL passes through plain agricultural fields (11.38%), tree crops and groves (11%), Tea Garden between AP 13-17, 33-34, 38-39 (11%) and Rubber Plantation (15%). The DL do not cross any National Highway, Railway and Power line. However, other than agriculture, this line traverses through metal roads, pond / lake, vacant lands, mud road etc. The DL route do not involve RF land hence do not necessitate forest clearance under Forest (Conservation) Act, 1980. Besides all PA like NP, WLS and designated wildlife / elephant passage have been completely avoided. The landslide study during electric line feature survey and GIS mapping reveals that the project region is very low vulnerable to landslide. The project area is not vulnerable to flood. The details are Depicted in **Annexure B6**. The type of hazard for the project line is recorded as earthquake, windstorm, low landslide and Flood.

As per detailed surveys and GIS imagery data ROW crosses the water bodies such as river, pond, drain. EP 32, 35, 62, 63 are planned in close proximity of water body. EP 86 is located close to River Manu. All EPs are planned along the existing road side / metal road. As all the pole locations are easily accessible through existing road to carryout construction and maintenance activity. EPs are constructed well above the ground level at required elevation to keep the people and animals away from EMF contact. It also prevents the structure getting damaged during flood situation.

GIS route survey map and DL feature details are provided in **Annexure A6 & B6**. The major feature details are depicted in **Table 4.7**. The Google earth image of DL is provided in the **Map 4.6**.

Table 4-7: 33 kV Line from 132/33 kV PK Bari (Existing) to 82 Mile (New) 33 kV line

Electric Line Feature Details-15m ROW		
Feature Class	Area in ha.	% Of Area
Agriculture Land	2.61	11.38%
Barren Rocky with Scrub Land	1.44	6.28%
Bricks Road	0.10	0.42%
Electric Substation	1.21	5.28%
Fallow Land	2.61	11.40%
Metal Road	2.65	11.56%
Mud Road	0.40	1.74%
Pond/Lake	1.18	5.15%
River	0.10	0.45%
Rubber Plantation/Orchards	3.49	15.24%
Stream	0.01	0.05%
Tea Garden	2.47	10.78%
Tree Crops and Groves	2.51	10.95%
Vacant Land	2.14	9.33%
Total	22.90	100%

Photographs of the site location are given below:



82-mile S/S Construction Site



Pole Location – Tree Crops and Groves



DL Section - Pole Location along Metal Road



DL Section - Agriculture Land

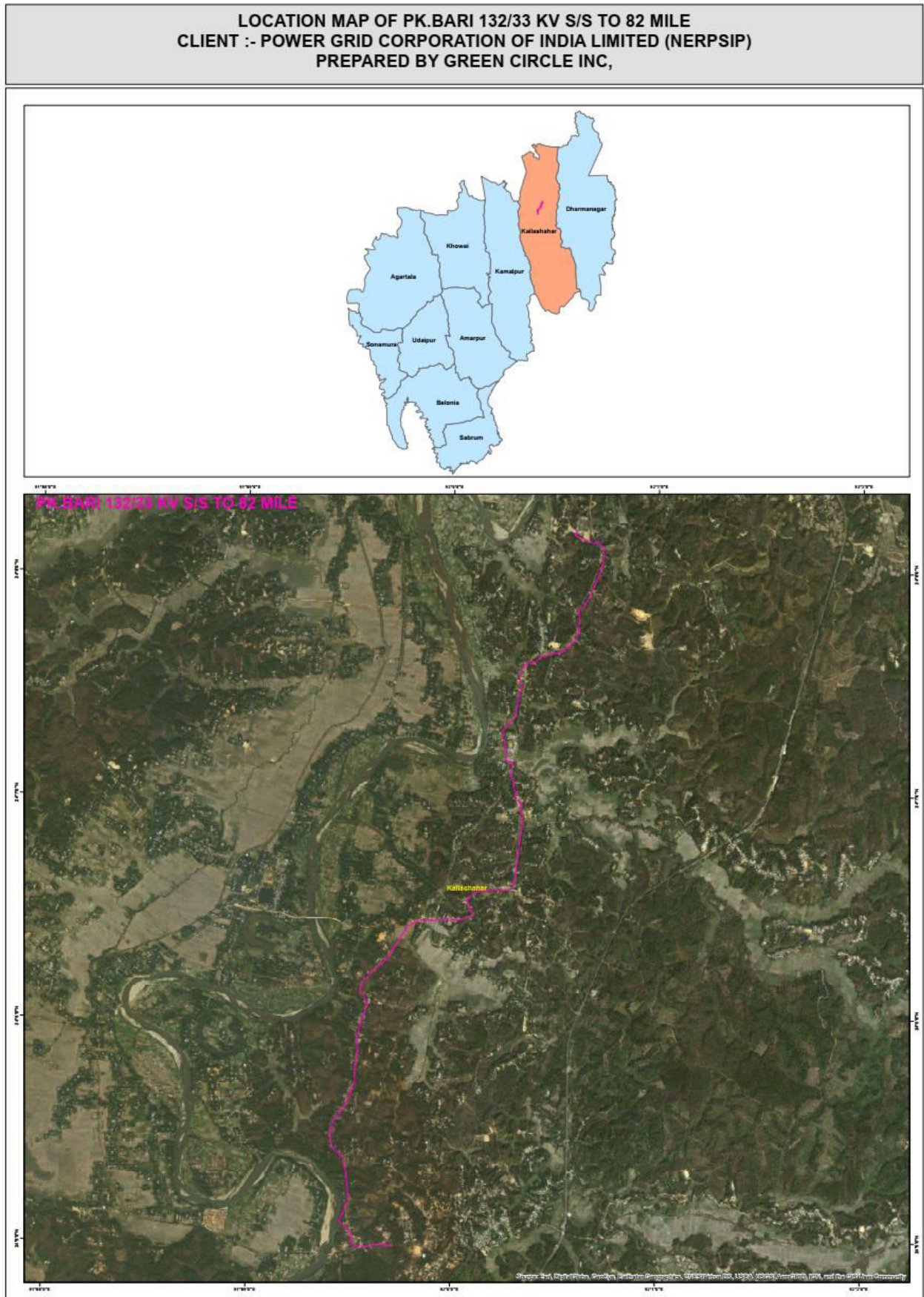


DL Section - Stream Bridge Crossing



DL Section - Along Lakes/Ponds site

Map 4-6: Google Earth Alignment Map of 33 kV Line from 132/33 kV PK Bari (Existing) to 82 Mile (New) 33 kV line



4.3.2.5 Feature Details of Final Route Alignment of 33 kV DL from Chailengta (New) to LILO point of Chamanu-Manu DL

33 kV DL from Chailengta (New) to LILO point of Chamanu-Manu DL covers 1.829 km distance. Total 73 EP are proposed in this DL. The DL is finalized after detailed analysis considering the environmental features like forest / PA / river etc. The feature survey along the TL is carried out considering 15 mt ROW width i.e., 7.5 mt on either side from center line of the corridor. Geomorphological studies observed that the geology of project area is majorly having primary rock structure of moderately dissected structurally hills and moderate valley fills. Rock type comprises Alluvium-sand/ silt & clay alternating beds and conglomerate of sand stone and pebble bed.

Major part of the TL passes through plain agricultural fields (41%), tree crops and groves (17%) and Rubber Plantation (17%). The selected line does not cross any National Highway, Railway and Power line. However, other than agriculture, this line traverses through metal roads, pond / lake, vacant lands, mud road, metal road etc. The DL route do not involve RF land hence do not necessitate forest clearance under Forest (Conservation) Act, 1980. Besides all protected areas like NP, WLS and designated wildlife / elephant passage have been completely avoided. The landslide study during electric line feature survey and GIS mapping reveals that the project region is not vulnerable to landslide. The project area is very low vulnerable to flood. The details are Depicted in **Annexure B7**. The type of hazard for the project line is recorded as windstorm and Flood.

As per detailed surveys and GIS imagery data ROW cross ponds. No EP coming near water pond. All EPs are planned along the existing road side / metal road. As all the pole locations are easily accessible through existing road to carryout construction and maintenance activity. EPs are constructed well above the ground level at required elevation to keep the people and animals away from EMF contact. It also prevents the structure getting damaged during flood situation.

GIS route survey map and DL feature details are provided in **Annexure A7 & B7**. The major feature details are depicted in **Table 4.8**. The Google earth image of DL is provided in the **Map 4.7**.

Table 4-8: 33 kV Line from Chailengta (New) to LILO point of Chamanu-Manu line

Electric Line Feature Details-15m ROW		
Feature Class Details	Area In Ha.	% Of Area
Agriculture Land	1.13	40.98%
Bricks Road	0.12	4.38%
Metal Road	0.21	7.56%
Mud Road	0.02	0.88%
Pond/Lake	0.06	2.17%
Rubber Plantation	0.47	17.09%
Tree Crops and Groves	0.48	17.26%
Vacant Land	0.08	2.75%
Waste Land	0.19	6.93%
Total	2.76	100%

Photographs of the site location are given below:



DL Section - Road Bridge Pole Location



DL Section - Metal Road/Pole Location



DL Section - Road Side Pole Location



DL Section - Pole Location in Residential area

Map 4-7: Google Earth Alignment Map of 33 kV Line from Chailengta (New) to LILO point of Chamanu-Manu line

LOCATION MAP OF LILO OF EXISTING CHHAMNU-MANU LINE AT CHAILENGTA (LOOP IN)
 CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED (NERPSIP)
 PREPARED BY GREEN CIRCLE INC,



4.4 Project Impacts

Based on the project details and the baseline environmental status, potential impacts due to the construction/ bay extension of sub-stations and along the final route of T&D lines have been assessed.

4.4.1 Impact of Transmission & Distribution Lines

As per existing law i.e., MoP Guidelines Dated 5th October 2015 for Payment of Compensation for TL / DL, land is not required to acquire for tower footing and ownership of land remains with the owner and is allowed to continue cultivation after construction. So, for all T&D Lines acquisition of land or any physical displacement is not applicable. However, as per the present provision in the Section 68 Electricity Act, 2003 and Indian Telegraph Act, 1885 only the damages (without acquisition of subject land) accrued to person while placing the tower and line are to be compensated (Section-10 (d) of Indian Telegraph Act).

However, some social impacts due to construction of lines or placing of towers and poles are seen like temporary removal of soil in agriculture land, loss of standing crops / trees during construction phase only. All mitigation measures as per EMP are implemented by contractor and immediately restored on site as per EMP. Care has been taken by the contractors to avoid unnecessary loss of crops.

4.4.1.1 Landuse within Corridor (Right of Way)

Total land occupied by T&D lines ROW is 120.62 Ha. The major land use occupied by T&D lines is agricultural land (36.72 Ha), Notified Forest Area under FCA 1980 (15.3556 Ha), rubber plantation (20.81 Ha), Tree, crops and groves (9.21 Ha) etc. Details of land use are provided in **Table 4.9**.

4.4.1.2 Impact on soil and surface geology

The project terrain is mixed. As discussed in the feature studies, almost 50 to 60% portion of project area is in undulating terrain. In plain areas impact on soil & geology is almost negligible as the excavated pit material is stacked properly and back filled as well as used for resurfacing the area. On hill slopes where soil is disturbed and prone to erosion is suitably protected by revetment, breast walls, and proper drainage. Besides extensive leg /chimney extension is being used to avoid benching or cutting of slopes to minimize the impact on slope stability.

4.4.1.3 Impact of tower base and pole on land

As per the assessment carried out in Compensation Plan for Temporary Damages (CPTD) by TSECL, the land required for erection of tower legs is very small i.e., for each leg of tower actual construction a small square area with side length ranging from 0.20 to 0.30 meter required depending on the types of towers. Four such square pieces of land is required to place the legs of tower. The area that becomes unavailable because of the erection of tower legs for an average 132 kV D/C TP ranges from 0.16-0.36 sq m of land. Thus, the actual impact is restricted to 4 legs of the tower and agriculture can continue as clearly depicted in the **Figure 4.1**.

In case of 33 kV DL area that becomes unavailable because of the erection of pole is insignificant as approx. 1 sq. ft. land area is occupied for one pole (please refer **Figure 4.2**). Due diligence

confirms that land is either agricultural or barren, and current land use is not altered and resumed after construction.

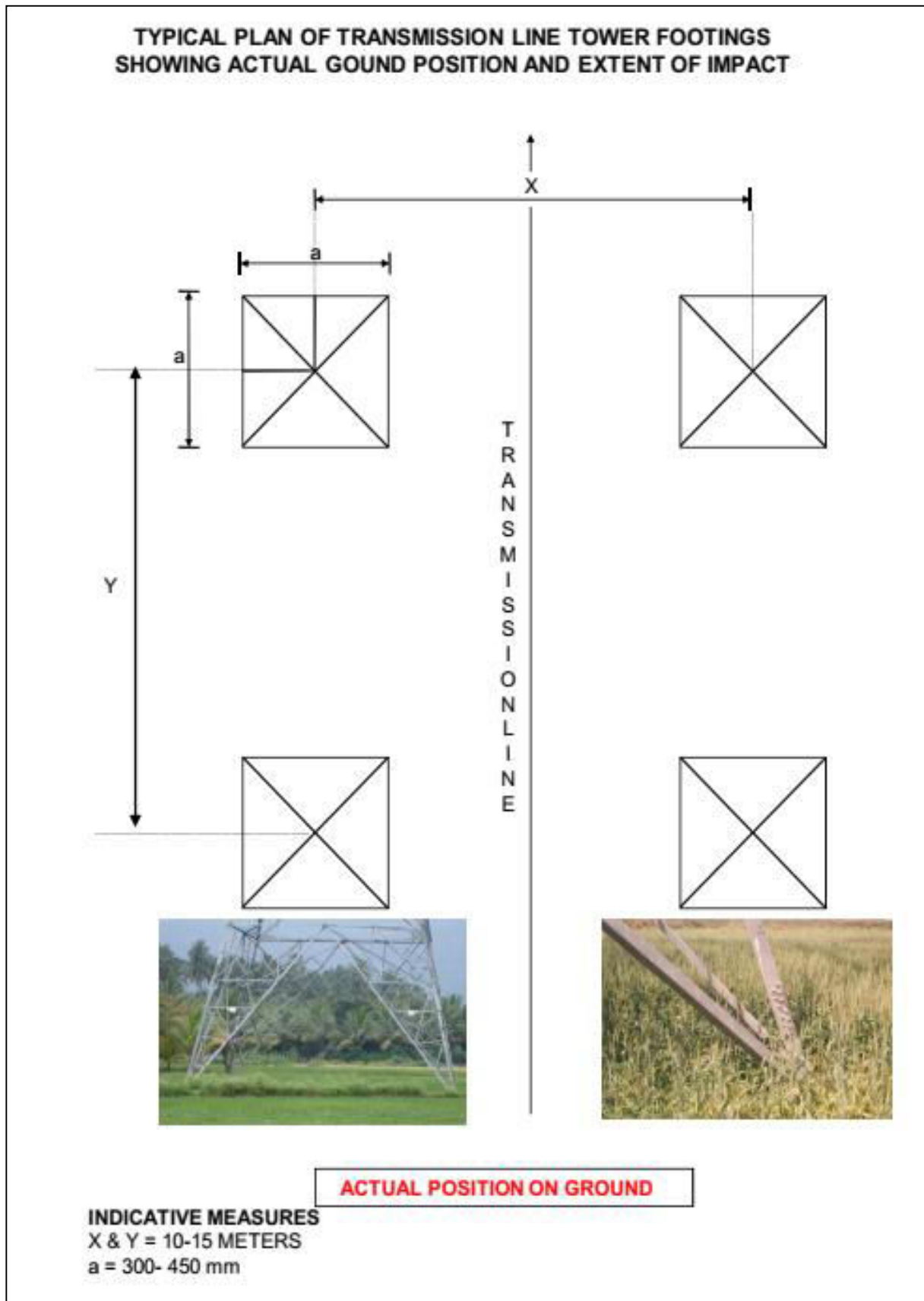
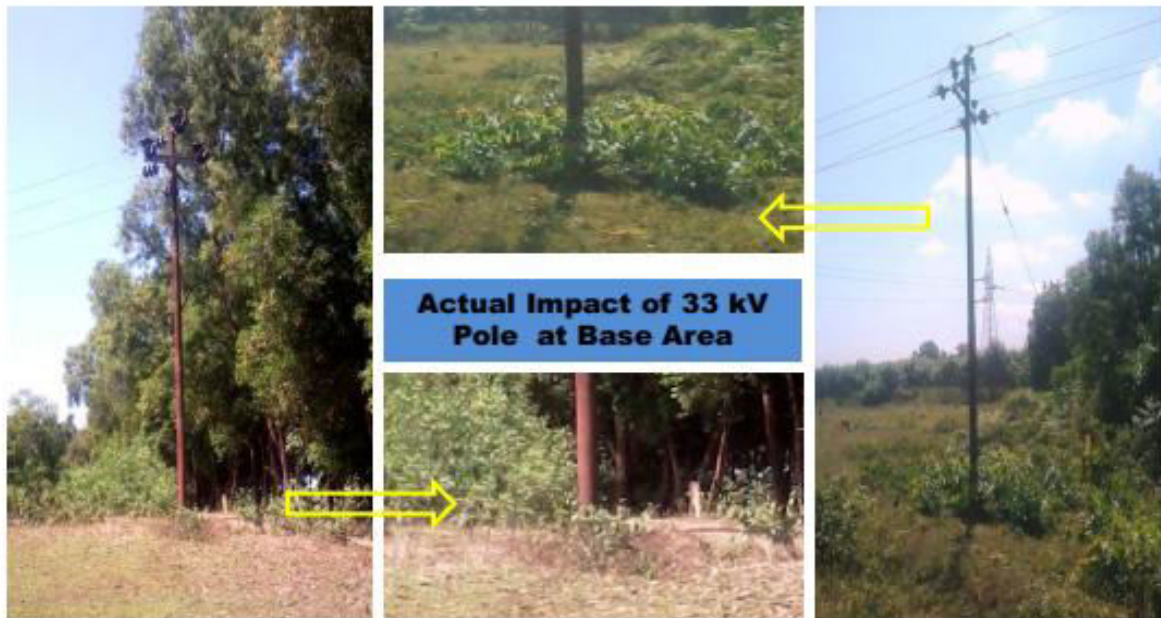


Figure 4-1: Typical Plan of Transmission Line Tower Footing



33 kV line inside city area



33 kV (H Pole) line inside substation

Figure 4-2: 33 kV Lines (Single & H Pole) Depicting Base Area Impact

As already explained, the impact of TL is restricted to 4 legs of the tower and agriculture can continue after construction activity is over. The average land area required for erection of one 132 kV T/L tower and one pole for 33 kV D/L is approx. 0.25 sq m & 0.092 sq m, respectively. Based on above, total land loss estimated for construction 26.401 km of 132 kV TL is 25.5 Ha and 36.929 km of 33 kV DL is 113 Ha proposed under the present scheme. However, the land loss impact is negligible and temporary for pole erection in DL case. The compensation toward loss land is provided by following compensation MoP Guidelines Dated 5th October 2015 for Payment of Compensation for TL. Details of land loss for tower base & pole are given

in **Table 4.10**. The details of Status of Land Compensation (details of line wise land compensation status updated till June 2021) are given in **Table 4.11**.

4.4.1.4 Impact on Crop area / Tree Crops and Groves

Construction of line in crop season is avoided as far as possible. In case when installation of towers / poles impact on agricultural activity, detailed assessment / survey is conducted looking at existing crops, general crop patterns, seasonal particulars, nature and extent of yield. Wherever necessary, permissions from tea estate owners were taken to erect towers/poles in their agricultural fields. This data is compiled and analyzed to study the extent and nature of impact. For the temporary loss of crops, only agricultural land and private plantation land is considered for estimation. The damages are not done in complete RoW of line (20 m width of corridor for 132 kV D/c) but mostly restricted to tip to tip of the conductor and tower base area where average affected width/corridor would be limited to 20 m (maximum). In 33 kV DLs, damages are minimal (mostly near bi-pole/quad pole structure) however, 10 m width of corridor is considered for accessing the damages. However, care was taken to reduce the damages to crops and to minimize the impacts whatsoever. The aspect is discussed in more detail in **section 5.2.5 in Chapter 5**.

One of the reasons is that schedules of construction activities are undertaken in lean season or post-harvest periods. Assets of any sorts are not acquired but during construction, only temporary damages are occurred. Based on the estimation of tower foot area as per the thumb rule explained in **section 4.4.1.3**, the total land considered for estimation of crop damage / tree damage because of tower foundation 22.25 Ha. The details of estimated impacted area due to TL ROW are given in **Table 4.12**. As per further detailed analysis and ground survey, the actual total no. of trees affected and status of Tree / Crop Compensation (details of line wise land compensation status updated till June 2021) are given in **Table 4.13**.

Impact on trees is assessed for all TLs within project scope where the actual trees cutting possibility is envisaged. However, in DLs actual impact is negligible as no Tree cutting is envisaged in DL. The aspect is discussed in more detail in **section 5.2.1 in Chapter 5**. Also, while construction of TLs fruit bearing season was avoided to prevent loss of crops. Tree compensation was calculated on the basis of tree enumeration and detailed surveys.

4.4.1.5 Impact on Trees in Forest Areas

As we discussed in the earlier sections in the instant case, tree cutting in Forest area is envisaged in Rokhia - Rabindra Nagar 132 kV D/C and Rabindra Nagar – Belonia 132 kV D/C TL sections. The total tree cutting details are provided in **Table 4.14**. The compensatory afforestation is to be compiled in double the area of forest which is under progress as prescribed in the specific conditions of Forest Clearances obtained for the lines. In this aspect forest department officials are concerned for the status updates.

Table 4-9: Type and Land Use within RoW of T&D Lines

Type and Land Use in ROW (Ha)	Transmission Lines		Distribution Lines					Total (Ha)
	132 kV D/C Kailasahar – Dharmanagar TL	LILO of 132 kV Ambassa – PK Bari line	33 kV DL from 132/33 kV Ambassa (Existing) to 33/11 kV Jawahar	33/11 kV line from Manu (New)-33/11kV Dhumachhera (New)	33 kV DL from 132/33 kV Manu (New) to 33/11 kV 82 mile	33 kV Line from 132/33 kV PK Bari (Existing) to 82 Mile	33 kV Line from Chailengta (New) to LILO point of Chamanu-Manu line	
ROW Width (m)	27.00	27.00	15.00	15.00	15.00	15.00	15.00	
Brick Road	0.17		0.12		0.20	0.1	0.12	0.71
Electric SS	2.35		0.74		0.22	1.21		4.52
Agriculture land	28.29		1.23	1.08	2.38	2.61	1.13	36.72
Vacant Land	0.68		1.84	0.28	1.67	2.14	0.08	6.69
Tree Crops and Groves	2.56		1.23	0.45	1.99	2.51	0.48	9.21
Pond /Lake	1.89		0.13	0.01	0.11	1.18	0.06	3.38
Barren /Rocky / scrub land	1.45			0.14	1.62	1.44		4.65
Fishing Pond					0.77			0.77
Tea Garden						2.47		2.47
Brick Kilns / Quarry	0.21		0.43					0.64
Bridge	0.001							0.001
Railway	0.06				0.05			0.12
Metal Road	0.60		0.68	0.54	0.92	2.65	0.21	5.60
Fallow Land						2.61		2.61
Mud Road	0.34		1.51	0.08	0.50	0.40	0.02	2.86
River	0.07		0.12	0.11	0.05	0.10		0.45
Pineapple Garden					0.74			0.74
Stream						0.01		0.01
Waste Land	1.35	0.09	1.12	0.29	0.87		0.19	3.92
Wet Land	0.17				0.05			0.22
Drain /Nala	0.42							0.42
Rubber Plantation/Orchards	9.12	0.85		2.34	4.54	3.49	0.47	20.81
Hill Open Forest	11.49		1.62					13.11

Table 4-10: Estimation of Actual Land Loss Because of Tower and Pole Base

Sr. No	Details of Power Line	Length in km	Total Towers / Poles	Land Loss / Tower or Pole (Sq. mt.)	Total land loss area for tower & pole base (sq. mt.)
A. Transmission Line Network					
1	Kailasahar- Dharmanagar 132 kV D/C line	21.916	81	0.25	20.25
2	LILO of 132kV Ambassa - PK Bari line at Manu S/S	1.175	8	0.25	2
3	132 KV Interconnection from old Manu S/S to New Manu S/s at Chauwmanu for charging at 132 KV S/C Manu to Chawmanu	15.3556	13	0.25	3.25
Total A		26.401	102		25.5
B. Distribution Line Network					
1	132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line	5.186	192	0.092	17.664
2	132/33 kV Manu (New) - 33/11 kV Dhumachhera (New) 33kV line	6.628	248	0.092	22.816
3	132/33 kV Manu (New) - 33/11kV 82 Mile (new) 33 kV line	15.192	430	0.092	39.56
4	132/33 kV P K Bari (Existing) -33/11 kV 82 Mile (New) 33 kV line	8.094	285	0.092	26.22
5	33/11kV Challengta (New) - LILO point of Chamanu-Manu Line	1.829	73	0.092	6.716
Total B		36.929	1228		112.976
Total A+ B		63.33	1330		138.476

Table 4-11: Details of Status of Land Compensation (details of line wise land compensation status updated till June 2021)

Sr. No	Name of the Line	Total Foundation Completed	Total Affected Persons for Tower Foundation	Compensation already paid to Affected Persons	Compensation for APs under progress	Total Compensation paid for Tower Base	Total Stringing Completed	Total Affected Persons in RoW Corridor	Compensation already paid to Affected Persons in RoW Corridor	Compensation for APs for RoW Corridor under progress	Total Compensation paid for RoW Corridor	No. of Pending cases/non-eligible cases with details thereof (e.g., Govt land/ title disputes/ any other
		(No.)	(No.)	(No.)	(No.)	(Rs. Lakh)	(Km)	(No.)	(No.)	(No.)	(Rs. Lakh)	
1	LILO132kV Ambassa-PK Bari	5	5	Nil	Nil	Nil	0.5	No provision of compensation for APs in ROW corridor				Nil
2	132 kV D/c K'shahar-Dharmanagar	33	21	Nil	21	Nil	Nil		Nil			
3	132 kV Manu-Manu	14	10	7	Nil	5.93	2.08		Nil			
Sub-total		368	236	137	62	51.31	18.86					25

Table 4-12: Loss of Crop Area

T&D Lines	Width Considered for estimation of loss of crops	Agriculture land Area in Ha	Tree Crops and Groves Area in Ha	Total Area Considered for Compensation in Line
Transmission Lines				
Kailasahar- Dharmanagar 132 kV D/C line	20	28.29	2.56	30.85
LILO of 132kV Ambassa - PK Bari line at Manu S/S		0	0	0

Table 4-13: Details of Crop & Tree compensation (details of line wise compensation status updated till June 2021)

S.I. No.	Name of the Line	Affected Persons (APs) issued with notice(No.)	Compensation already paid to APs (No.)	Compensation to APs under progress (No.)	Affected Land Area (Ha.)	Compensation Paid for crop damages (Rs. Lakhs)			Total Tree Affected (No.)	Compensation Paid for Tree damages (Rs. Lakhs)			No. of Pending cases/non-eligible cases with details thereof (e.g., Govt land/titl disputes/ any other reasons)
						Foundation	Erection	Stringing		Foundation	Erection	Stringing	
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
1.	LILO132kV Ambassa-PKBar	6	6	Nil	0.0541	Nil	Nil	Nil	376	6.871	Nil	11.42	Nil
2.	132 kV D/c K'shahar-Dharmanagar	21	18	3	Nil	2.050	Nil	Nil	787	3.63	Nil	Nil	7 (discrepancy in land documents)
3.	132 kV Manu-Manu	32	32	Nil	0.291	1.955	Nil	0.213	4239	2.904	Nil	3.851	Nil
Sub-total (Tripura)		486	326	125	9.624	17.21	1.115	1.091	17561	100.2	1.936	143.86	51

Table 4-14: Loss of Trees

Sr. No.	Name of Line	Trees to be cut (No.)	Forest Area (Sq. Mt.)
1	132 kV D/C of Dharmanagar-Kailasahar TL	1032 Trees, 9870 Bamboos	20346
2	132 kV LILO of PK Bari-Ambassa at Manu TL	235 Trees, 00 Bamboos	10
3	Interconnection of Old Manu-New Manu TL	307 Trees. 165 Bamboos	9084
Total		1574 Trees, 10035 Bamboos	29458

4.4.1.6 Other Damages

Major part of T&D lines goes from agricultural fields. Habituated areas and other sensitive areas were purposely avoided to prevent damages. So, there is no possibility of damage to bunds, water bodies, etc. However, if damaged, local revenue department assess the cost of damage as per norms of GoT and submit estimate to the competent authority for approval.

4.4.2 Impact Due to Construction of New S/S and Bay Extension

All the S/S are being constructed on vacant lands owned by TSECL, so there is no displacement of people for this project. Therefore, there is no any social impact on the people residing in this area. Minor improvements to paths were made to reach to the new S/S, which is found useful for the local people of the particular area.

4.4.3 Impact on Indigenous People

GoI, under Article 342 of the Constitution, considers the following characteristics to define indigenous peoples [Scheduled Tribes (ST)]:

- tribes' primitive traits;
- distinctive culture;
- shyness with the public at large;
- geographical isolation; and
- Social and economic backwardness before notifying them as a Scheduled Tribe.

Essentially, indigenous people have a social and cultural identity distinct from the 'mainstream' society that makes them vulnerable to being overlooked or marginalized in the development processes. STs, who have no modern means of subsistence, with distinctive culture and are characterized by socio- economic backwardness, could be identified as Indigenous people. Indigenous people are also characterized by cultural continuity. Constitution of India identifies schedule areas which are predominately inhabited by such people. As, this project is directly connected with the life of local people of Tripura, there is no negative impact on indigenous people because of this project. Local people are cooperating project related authorities.

4.4.4 Summary of Impacts

Based on the above analysis of final route of T&D lines and location of S/S, the summarized environmental & social impact matrix is presented below in **Table 4.15**.

Table 4-15: Summary of Impacts

Sr. No.	Parameters	Extent of Impact
1.	Total Line Length	Transmission line: 26.401 km Distribution line: 36.939 km
2.	Total No. of Poles	TL Towers: 102 DL Poles: 1228
3.	Terrain	Plain and hilly Almost entire (approx. 50 to 60%) of lines are passing through hilly area and remaining approx. 40 to 50% through plains. All S/S are constructed/ augmented are in plain areas. However, at all S/S locations, provisions for revetment like retaining wall, boundary wall, breast walls, and proper drainage and sewerage system etc. have been made. Besides extensive leg /chimney extension is being used to avoid benching or cutting of slopes to minimize the impact on slope stability. All safety measures like fire wall, fire extinguishers, etc. are provided.
4.	Forest land transverse	Transmission Line: 14.3586 ha (RF) <ul style="list-style-type: none"> • Stage-I & Stage-II (final) approval obtained on 10.04.18 & 07.06.19 respectively. Distribution Line: 0.9722 Ha (RF) <ul style="list-style-type: none"> • Stage-I clearance issued on 02.03.2021. • Working permission obtained on 10.05.2021
5.	Rare/Endangered flora	Aegle marmelos is recorded in the study area which is near threatened species as per Conservation Status IUCN (2020.1)
6.	Rare/ endangered fauna	No rare/endangered fauna habitat found in project area.
7.	Total trees to be cut	132 kV D/C of Dharmanagar-Kailasahar TL: 1032 Trees, 9870 Bamboos 132 kV LILO of PK Bari-Ambassa at Manu TL: 235 Trees, Interconnection of Old Manu-New Manu TL: 307 Trees. 165 Bamboos
8.	Cleaning jungles of rank vegetations, grass , brush, wood , tree and saplings of girth up to 30 cm (measured at a height of 1 m above ground level)	132 kV D/C of Dharmanagar-Kailasahar TL: 20346 sq. mt. 132 kV LILO of PK Bari-Ambassa at Manu TL: 10 sq. mt. Interconnection of Old Manu-New Manu TL: 9084 sq. mt.
9.	Migrating Wildlife/ breeding ground	NA
10.	National Park / sanctuaries	No protected areas involved
11.	Wet land traversed	None
12.	Soil erodibility	Project locations are very low vulnerable to erosion and landslide. However, the mitigation measures are adopted and implemented.
13.	Historical / Cultural monuments	None
14.	Relocation of villagers	None
15.	Affected Structures	NA
16.	Total Affected People	NA
17.	Relocation of Villagers	NA
18.	Area of actual land loss under Tower Base	25.5 sq. mt. Tower Base 113 sq. mt. Pole Base
19.	Affected Structures	Nil
20.	Temporary Damage to Crop	Temporary loss is observed during construction time. It is being recovered after construction activity
21.	Loss/ Hindrance to Public Utilities	Negligible, restricted to construction phase only.

5. POTENTIAL ENVIRONMENTAL IMPACT, THEIR EVALUATION AND MANAGEMENT

5.1 Introduction

Environmental impacts of T & D projects are not far reaching and are mostly localized to RoW. **(Refer Table 5.1)**. However, T&D projects have some effects on natural and socio-culture resources. All possible measures have been taken during the finalization of route alignment as described in the earlier chapter for the proposed T&D system, however, due to the peculiarity of terrain where project is being implemented, some environmental impacts may be there. The explanations in brief with regard to possible environmental impact and measures taken to minimize the same are given in ensuing paragraph.

Table 5-1: RoW Width & Clearance between Conductors and Trees

Transmission Voltage	Max. RoW (In Meters)	Min. Clearance (in Meters) between conductor & Trees *
132 kV	27	4.0
33 kV	15	2.8

As per IS: 5613 and MoEF&CC guidelines finalized in consultation with CEA

5.2 Impact Due to Project Location and Design

5.2.1 Resettlement

During line routing stage itself all measures have been undertaken to avoid settlements such as cities, villages etc. in line with the guiding principle of avoidance as per ESPPF. During detail survey modern techniques/tools like GIS, GPS, and aerial photography were utilized to further optimization the final route alignment avoiding human habitation and other ecological and socially sensitive areas.

In present project construction of total 10 New S/S is under execution. The details are given in **Table 2.24 in Chapter 2 Section 2.6**. In general requirement of land area for S/S varies from 0.3 acres (for 33 kV) to 10 acres depending upon voltage levels and no. of bays. In the instant scheme, TSECL does not need to acquire lands for new S/S as well as for augmentation of S/S as TSECL already possess land for all proposed new S/S as well as for augmentation of existing S/S. As no fresh land is needed to be acquired for these S/S, issue related to acquisition of land including possible R&R is not envisaged. The details are discussed in **Chapter 2 in section 2.6**.

In respect of land requirement for erection of T&D lines / towers / poles, no permanent acquisition is envisaged. Land for tower and ROW is not acquired as agricultural activities can continue. A Typical plan of TL tower footing indicating the above position with extent of damage and area of influence are depicted in **Figure 5.1 and 5.2** respectively

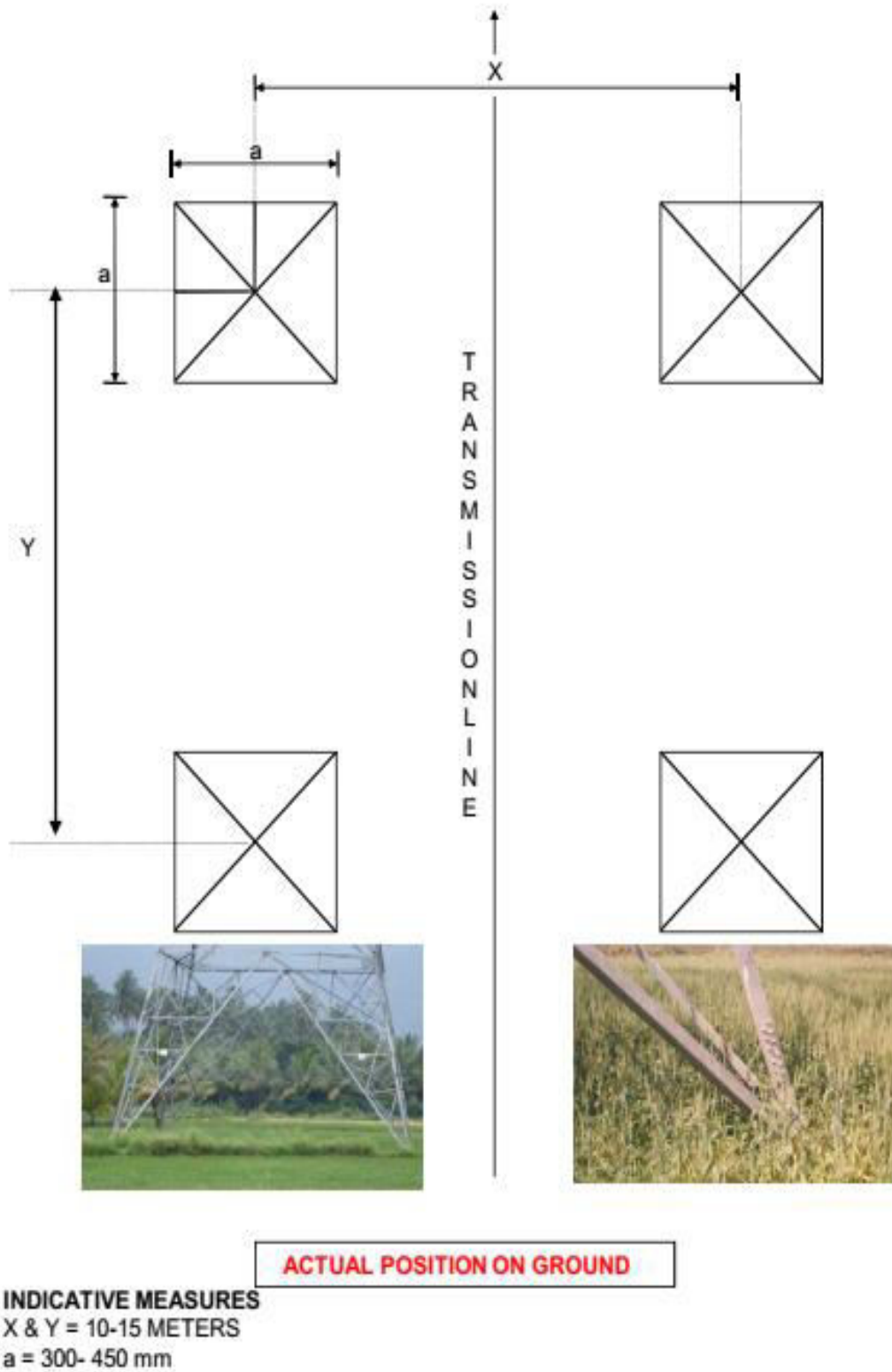


Figure 5-1: Typical Plan of Transmission Line Tower Footings Showing Actual Ground Position and Extent of Impact

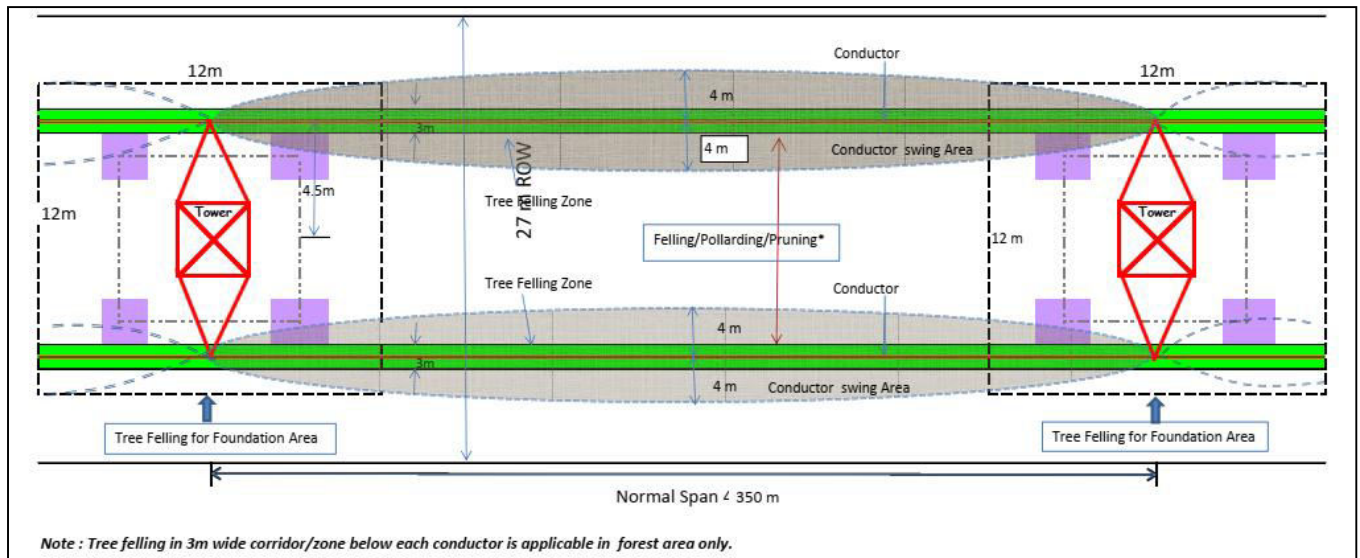


Figure 5-2: Schematic Diagram for Indicating Area of Influence/Impact for 132 KV D/C TL

Actual 132 KV line including tower on ground along with RoW and extent of impact due to erection of tower in undulating terrain, on agricultural land and in the area of vegetation is placed as **Figure 5.3, Figure 5.4. Figure 5.4** depicts the base of 33 kV DL (Single & H pole).

As described earlier all measures are undertaken by TSECL at the line routing stage itself to avoid settlements such as cities, villages etc. It may be seen from the above description of proposed route alignments and also keeping in mind that no permanent acquisition of land is involved for tower foundation as per existing law, these subprojects don't require any resettlement of villagers. However, some temporary damages/ disturbances can happen. Same are being compensated by the project under CPTD to minimize the damages and provide compensation plan for temporary damages in consultation with the GoT and PAP and/or community.

The project is being implemented in the tribal areas governed by TTAADC as per the provisions of Sixth Schedule of the Indian Constitution. It may be noted that all social issues are being dealt separately in accordance with the provisions of Social Management Framework (SMF, A-C), placed in the ESPPF of TSECL.



Figure 5-3: 132 kV line depicting actual position along with RoW and extent of damage



Figure 5-4: 132 kV Tower Base Showing Impact on Agricultural Land and Crop

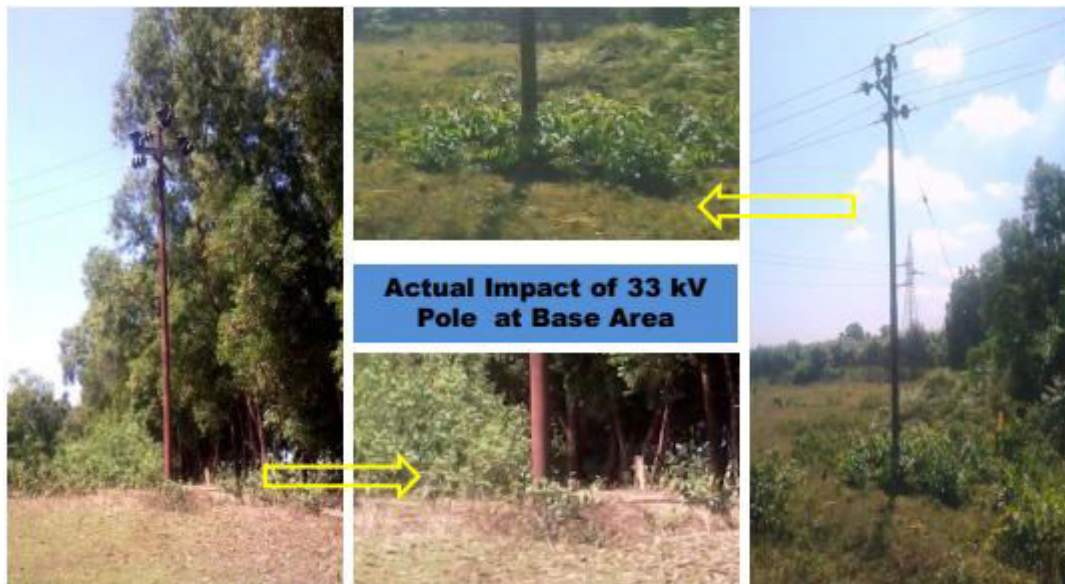


Figure 5-5: 33 kV Lines Depicting Base Area Impact

5.2.2 Land value depreciation

The electric power acts as a catalyst for the growth and development of areas having accessibility to it. Based on previous experiences, land prices are generally expected to rise in the areas receiving power. In the present project, TLs pass through agriculture fields, private plantation area where the land-use is not going to change in foreseeable future. Therefore, the value of land is not adversely affected to a significant degree. Moreover, DLs are primarily intended to provide power supply to populated area which boosts the economic status as well as land price of the area, thus, outweighing possible negative impacts, if any.



5.2.3 Historical/cultural monuments/value

As per the policy of route selection, only that route alignment is finalized which avoids all the historical and cultural monuments. As per the preliminary assessment carried out during finalization of route alignment in consultation with State revenue authorities and Archaeological Survey of India (ASI), no such monuments are coming in the proposed route alignments. Moreover, utmost care to be taken during detailed survey to avoid such areas. Also, the chance found procedure is already considered in the procedures.

5.2.4 Encroachment into precious ecological areas

As explained in **Chapters 2 in section 2.4.5 and Chapter 4 in section 4.2 during TL and DL planning** all precautions have been taken right from planning stage to avoid routing of line through forest and PA like NP/WLS. In spite of taking due care during route selection, involvement of some forest area could not be avoided completely. Moreover, PA like WLS, NP, biosphere reserves etc. have been avoided completely. However, reference in EMP is maintained to address the issues in case of any eventuality / chance found condition. In the instant scheme one of the lines i.e., Kailasahar - Dharmanagar 132 kV D/C TL was passing from very near from Rowa Wildlife Sanctuary and rich biodiversity. The line was realigned to avoid any impact on wildlife and now passing at a distance of 4.8 kms from Rowa WLS boundary. The same is shown in **Annexure 3**. Details of forest involvement in different lines are presented in **Table No.5.2**. Thus, the potential impacts on Wildlife are minimized. Along with this ESPPF is strongly followed by IA during execution of project work.

Table 5-2: Details of Forest Involvement in Different Lines

Sr. No.	Name of Transmission Line	Forest Involvement (In ha.)
1	Kailasahar- Dharmanagar 132 KV D/C line	14.3586
2	132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line	0.9972
3	33 kV Jawaharnagar - Dhumachera line	21.33**
Total		36.69

** : The line study is presented in Addendum I.

Stage I and Stage II Prior approval of GoI/MoEF&CC is obtained as on 10th April 2018 and 07th June 2019 respectively for Kailasahar- Dharmanagar 132 KV D/C line under Forest (Conservation) Act, 1980. For 132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line Stage-I clearance issued on 2nd March 2021 and Working permission obtained on 10th May 2021. 33 kV Jawaharnagar - Dhumachera line- Stage-I issued on 28.06.2021. CA, NPV deposited. Working permission obtained on 29th August 2021. It may be seen from the above table that out of total TL/DL of 63.33 km, 5.8 km is passing through forest.

Compensatory afforestation is a mandatory requirement where diversion of forest land for non-forest purpose is involved. The compensatory afforestation for Kailasahar- Dharmanagar 132 KV D/C TL is being raised and maintained by Forest department over the double area diverted i.e., 28.99 Ha of degraded forest land identified in Balidhum and Samrupar Mouja, Panisagar and Kailashahar Range, Dharmanagar and Kailashahar Forest Sub-Division of North and Unakoti District of Tripura.

Compensatory afforestation has been raised by Forest department over the double area diverted in case 33kV Ambassa - Jawaharnagar & 33 kV Jawaharnagar - Dhumachera involving diversion of forest area of 0.99728ha is & 21.33 ha. Respectively. In case of 33kV Ambassa – Jawaharnagar the CA is being raised and maintained by Forest department over the double area diverted i.e., 2.0 Ha of degraded forest land identified in Mouja Sardingkhapara, CS Plot No. 34, Kh No. 3/6 under Gumti WLS. In case of 33 kV Jawaharnagar - Dhumachera the CA is being raised and maintained by Forest department over the

double area diverted i.e., 42.67 Ha of degraded forest land identified in Mouja Paschim Nulicherra, CS Plot No. 01 (P), Rev. Khaitan No. 2/22, Ambassa Range, Ambassa Forest Sub-division in Dhalai District.

Details related to tree felling, CA land, deposition of money by IA etc. are available publicly on Parivesh website. Payment with respect to CAMPA is being arranged by IA. All the compliances are being submitted to Forest Department by IA. Other Clearances and NOCs under FRA 2006 are being complied with. Funds required for Compensatory plantation to Forest Department are arranged by TSECL / IA. All the other stipulated conditions in the clearance copy are followed strictly. The copy of MoEFCC clearance for Kailasahar- Dharmanagar 132 KV D/C TL is depicted in **Annexure 5**. All the compliances are being submitted to Forest Department by IA.

The exercise is completed through detail survey and finalization of route through forest area in consultation with local forest authorities as per well-established forest clearance process described in ESPPF. As per the initial study/assessment most of the forests to be traversed by the subject lines are categorized as RF and found to be in various degree of degradation and even the wildlife species present are those who have adapted to open or disturbed habitat. It has also been confirmed by forest department that the plantation of *Tectona grandis*, *Shorea robusta*, *Terminallia bellirica* species have been carried out during last decade to enhance the density and quality of forest. Nonetheless, to mitigate losses to existing forests, clearing of the TL ROW is being done under supervision of forest department, and some low canopy seed trees and shrubs may be kept intact which are not interfering with tower erection and line installation. The extracted wood is being sold by the forest department under the process of auction following prescribed guidelines in FC Act 1980. Three-meter-wide strips of land below each conductor is being cleared during construction and one such strip is being kept free of vegetation for maintenance purpose and regeneration up to certain height in remaining width of RoW is allowed after construction activity.

Periodical lopping/pruning of trees to maintain line clearance is being done under the direction of forest department (for details refer **Figure 5.3** for tree failing pattern and refer **Figure 5.2** for area of influence). Moreover, to prevent unauthorized tree felling in forest area. measures like providing construction crews with fuel wood or alternative fuels by Contractor has been specified in **EMP (refer clause- 24)**.

TL can serve as new access routes into previously inaccessible or poorly accessible forests, thereby accelerating forest and wildlife loss. In such cases, TSECL cannot take action itself, but local Forest Department personnel normally assess the dangers and take appropriate action, such as establishing guard stations at the entrance to the forest etc. cost of which is borne by TSECL. Given the already easy access and degraded conditions at the proposed subprojects sites, this problem is not expected to be encountered. Nonetheless, TSECL staff has to report to the Forest Department any noticeable encroachment induced by the Projects in such situations.

The tree cutting in non-forest area was avoided during construction activities at S/S locations and at TLs to the maximum possible extent. Trees are only removed to maintain electrical safety clearance. During land development prior to construction of substation shrubs/trees on the plot are cleared that create hinderance to work. In TLs corridor, only 3 m strip below each conductor is cleared during stringing activities and natural vegetation is allowed in cleared strips barring one which is kept for maintenance activity. In remaining corridor, mostly pruning/looping is done to maintain electrical clearance. There is no provision of compensatory plantation in non-forest area in lieu of tree cutting in Tripura State as per the prevailing rule for Tree Extraction vide notification No.F.7(44)/For/FP-200 I/PT11/29.042 dated 17.01.2002 and The Electricity Act 2003. **Please Refer Annexure 11**. However, compensation is paid to farmers/owners after assessment of actual damage duly certified by revenue/forest/horticulture/rubber board authority as per provisions of The Electricity Act, 2003 & The Indian Telegraph Act, 1885. During our site visit and verification of documents it has been observed that the IA is complying with all such provisions in spirit. Compensations are being paid following CPTD compensation for all damages to the tree owners as explained in **Section 4.4.1**.

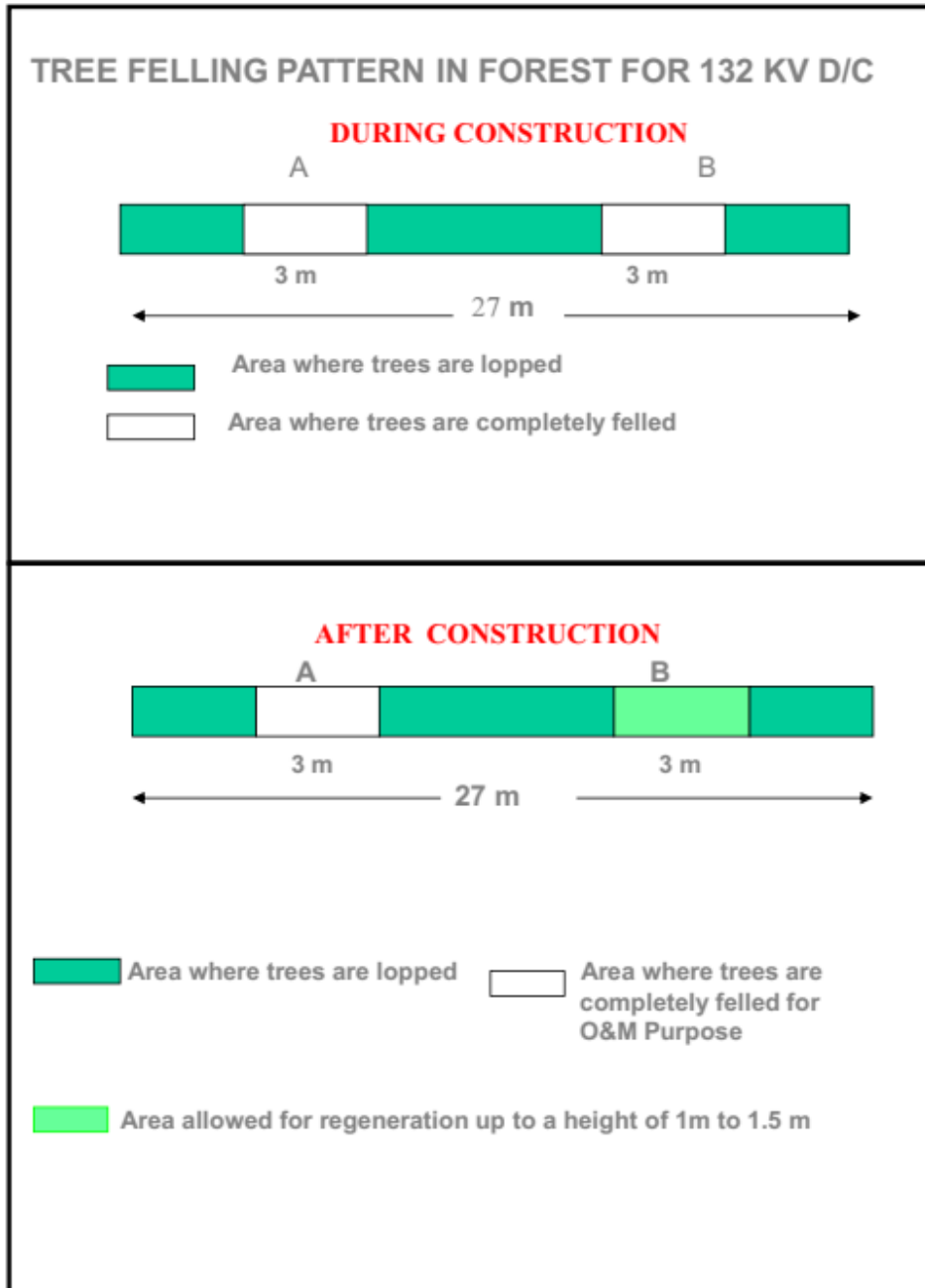


Figure 5-6: Tree Failing pattern



Figure 5-7: Example of Pole erection where Tree is Prevented from Cutting

5.2.5 Lines into other valuable lands

Total land occupied by T&D lines ROW is 120.62 Ha. The major land use occupied by T&D lines is agricultural land (36.72 Ha), Notified Forest Area under FCA 1980 (15.3556 Ha), rubber plantation (20.81 Ha), Tree, crops and groves (9.21 Ha) etc. Details of land use are provided in **Table 4.9**.

MoP, GoI issued guidelines for payment of compensation towards damages in regard to ROW for TL on October 15, 2015, stipulating payment of 85% of land value for tower base area (between four legs) and compensation towards diminution of land value in the width of RoW corridor subject to a maximum of 15% of land value. **Refer Annexure 6**. However, these guidelines are not adopted GoT till date, hence the existing practice of 100% land cost for tower base are being implemented. The letter was issued to TSECL regarding adoption of MoP, GoI Guidelines for payment of compensation towards damages in regards to RoW for TLs vide ref. NEAGT/NERPSIP- 102/2017-18/212 dated 15/05/2018. **Please Refer Annexure 7**.

TSECL intimated POWERGRID that GoT has decided for continuing with the prevailing practice of payment of compensation towards damage in regards to RoW for TLs. **Please Refer Annexure 8**.

Once the tree/crop is removed / damaged, TSECL issues a tree cutting/crop damaged notice to the land owner with a copy to the Revenue Officer to process the compensation payment. Based on the above the compensation payment is generated by means of a computerized program developed by the National Informatics Centre exclusively for this purpose. The detailed Valuation statement thus generated using this program is verified at various levels and approval of payment of compensation is accorded by the concerned

District Collectors. On approval of compensation, the revenue officer shall further intimate the amount payable to the different landowners and TSECL arranges the payment by way of Demand Draft/Cheque to the affected parties. The payment is further disbursed at the local village office after due verification of the documents in presence of other witnesses. A sample case of compensation payment including notice to land owner, assessment and verification by revenue authority and payment to affected person etc. is enclosed as **Annexure 9**. The sample case of compensation payment including notice for crop/tree compensation provided in **Annexure 10**.

As described earlier in **section 4.4.1.3, 4.4.1.4 and 5.2.1** all measures are undertaken by TSECL at the line routing stage itself to avoid settlements such as cities, villages etc. It may be seen from the above description of proposed route alignments and also keeping in mind that no permanent acquisition of land is involved for tower foundation. As per existing law, these subprojects don't require any resettlement of villagers. However, some temporary damages/disturbances can happen. Same are being compensated under CPTD which is developed to minimize the damages and provide compensation plan for temporary damages. This is executed in consultation with the GoT and affected persons and community. As per existing laws and CPTD compensation for all damages (land / tree / crop) paid to the individual land owner. **Please Refer Table 4.11 and Table 4.13**. Budgetary provision of **Rs. 127.45 lakhs** have been made in the cost estimate to meet these expenses. **Refer Annexure 11**. Please refer **Chapter 4 section 4.4.1.3 and 4.4.1.4** for the details of compensation for tree, crop and land already paid till June 2021.

Agricultural activities are allowed to continue following the construction period. If bunds or other on-farm works are disturbed during construction or maintenance, they are restored to the owner's satisfaction following cessation of construction or maintenance activities.

5.2.6 Interference with other utilities and traffic

As per regulations enacted by GoI, it is mandatory for TSECL to seek clearance prior to construction from department of Railways, Telecommunications and wherever necessary from aviation authorities that are likely to be affected by the construction of TL. The TL affect nearby telecommunication circuits by causing electrical interference. A standing committee Power Telecom Co-ordination Committee (P.T.C.C.) has been constituted by GoI to plan and implement the mitigating measures for the induced voltage which may occur to nearby telecom circuit and suggest necessary protection measures to be adopted. The committee suggests measures like rerouting of the telecom circuits, conversion of overhead telecom circuits into cables etc. to minimize the interference. In the instance case no line is required Aviation and PTCC NOCs.

National Highway – 44 is the main approach road, which connects the construction sites including the proposed S/S through various state highways, district roads and village roads. It connects Shillong, the state capital of Meghalaya with Sabroom, near India-Bangladesh in Tripura, passing through Agartala. It runs for a distance of 630 km, of which 184 km is in Meghalaya, 111 km is in Assam and 335 km (208 mi) is in Tripura. NH-44 is also the only National Highway that links Tripura state capital Agartala with the rest of the Seven Sister States. The volume of traffic on the NH- 44 is quite low. It may be judged from the fact that this Tripura portion of NH-44 from Churaibari to Sabroom near Bangladesh border was decided to be upgraded to 4 lanes by National Highway Authority of India (NHAI) in 2007. However, due to low density of traffic, it has now been taken up for 2 lanes instead of 4 lanes as decided

earlier. Therefore, we don't foresee any steep rise in volume of traffic due to mobilization for said projects.

Wherever TL crosses the railways, clearance is taken from that department. In general, the system is planned and executed in such a way that adequate clearance is maintained between TLs on the one hand, and railways, civil aviation and defense installations on the other. Wherever the TLs pass by the airports the towers beyond specified height are painted in alternate orange and white stripes for easy visibility and warning lights are placed atop these towers.

5.2.7 Interference with drainage pattern

As the TLs are constructed aurally and the blockage of ground surface is limited to very small area of tower footings, there is little possibility of affecting drainage pattern in case EMP is not followed during construction. In the instant case well planned EMP is designed and it is mandatory for contractor to follow the clauses with site specific implementation plan. All the Towers and Poles are being erected at suitable elevation and region specific at above flood level. All the EMP measures are being followed on site.

5.2.7.1 Towers/ Poles and drainage pattern

In the instant project, no towers are to be placed in river beds for river crossing. However, in case of towers / poles near water body, management measures as specified in **EMP (refer clause - 5 & 12)** like appropriate siting of towers are undertaken during detailed alignment survey and design to avoid any incidence of flooding hazards of loss of agricultural production due to interference with drainage patterns or irrigation channels. In the infrequent instances where the natural flow/drainage is affected, flow is trained and guided to safe zones. The erection of poles / towers is proposed above ground level at desired elevation to avoid flood situation and flood impacts. The **Annexure A** for GIS maps can reveal that the project is planned with suitable site-specific elevation above ground level.

Provision of drains around the tower pad in plain area is made as the monsoon is very intense and unpredictable in this area. To avoid any interference, DC towers are being used instead DB tower as single span limit is crossed in the stretches where TL/ DL is crossing river; cross-arm strengthening has been suggested. Also, as mentioned in previous chapter, use of leg extension is being implemented for towers to minimize/avoid benching/revetment, to minimize/ avoid chances of soil erosion, to minimize/ avoid sedimentation of river, to provide great stability.

5.2.7.2 Substations and drainage pattern

Since all proposed S/S are located mostly in plane terrain no effect on drainage of the area is envisaged. All the S/S are having systematic and adequate arrangement of drainage system right from design stage and are implemented on site. All drainage channels along or inside S/S are being trained and connected to main or existing drainage to avoid any erosion due to uncontrolled flow of water. Boundary wall at all S/S locations and Retention wall are proposed and being constructed at S/S locations where required. The actual site photos and status are shown in **section 5.4.1**. The sample drainage layouts are given in the **Annexure 12**.

5.3 Environmental Problems Due to Design

5.3.1 Escape of polluting materials

The equipment installed on lines and S/S are static in nature and do not generate any fumes or waste materials. However, detailed specification with respect to equipment design and S/S drainage and sewage design has been included in tender document to avoid any incidence of land and water contamination. Transformers have been designed with oil spill containment systems having sump of capacity of 200% of oil volume of largest transformer, and purpose-built oil, lubricant and fuel storage system, complete with spill cleanup equipment. Hazardous Waste Management compliances are being followed at each S/S. S/S is also equipped with drainage and sewage disposal systems to avoid offsite land and water pollution. Apart from this, solid waste like packing materials, cables, aluminum conductor, sand, aggregate material, cements and steel generated during construction is carefully handled and removed from the sites periodically to avoid any contamination. Also, the system helps in avoiding accidents through contamination, spills and fire.



Transformer Erection with Oil pit in Progress – Ambassa S/S

5.3.2 Explosion/fire hazards

It may be noted that S/S are being constructed on the land provided by TSECL after considering all the risks and after following ESPPF. During the survey and site selection for TLs, and S/S, it has been ensured that these are kept away from oil/gas pipelines and other sites with potential for creating explosions or fires. Fires due to flashover from lines can be a more serious problem in forest. However, adequate safety measures are being taken to avoid such incidence and has been included in **EMP (refer clause - 15, 23 & 51)**. Besides this forest authorities also incorporate measures like making fire lines to prevent spreading of fire in the affected forest area. Apart from this, state of art safety instruments like automatic tripping system is installed in the S/S on both the ends so that line gets tripped within milliseconds in case of any fault. Firefighting instruments including fire extinguishers are kept in appropriate place for immediate action in case of any fire hazard. Firefighting system is well adopted along with general requirements and fire safety requirements. All the measures are implemented at all the S/S locations. The details of Firefighting system are given in **Annexure 13**.

5.3.3 Erosion hazards due to inadequate provision for resurfacing of exposed area

Construction of 132kV line involves only small-scale excavation of area i.e., 3m L x 3m W x 3m H for tower footing that may result in generation of 108 m³ of excavated material from each tower. In case of 132/33 kV S/S foundation, excavation of soil to the tune of 7500 m³ is required depending on site condition. Similarly, in case of 33 KV line, soil excavation is limited to 0.72 m³ for each pole, and for 33/11 KV S/S, excavation of around 2000 m³ is required. It is estimated that a total of approximately 31400.16 m³ (102 x 108 + 7500 x 1 + 1228 x 0.72 + 6 x 2000) of excavated materials is expected to be generated for construction of 102 numbers of TL tower, 1 no of 132/33 KV S/S, 1228 numbers of DL EP and 6 numbers of 33/11 KV S/S proposed under present scheme. Moreover, the topsoil disturbed during the development of sites are stored properly and used to restore the top surface of the platform. Left over infertile and rocky material being used as fill for foundations and leveling / backfilling as detailed out in EMP (refer clause - 25, 26 & 28). Hence, possibility of erosion of exposed area due to construction activity is negligible.

5.3.4 Soil erosion and contamination

Construction of each 132kV tower and 33 kV pole foundations involve generation of approx. 108 m³ and 0.72 m³ excavated earth respectively. Similarly, each 132/33 kV & 33/11 kV S/S would generate approx. 7500 m³ and 2000 m³ excavated earth respectively. So, construction of 102 133kv towers generates 25.5 m³ earth and 1228 33kV poles generate 113 m³ earth.

It has been observed that soil excavated for tower/pole footings and S/S construction are optimally utilized for backfilling and the remaining soil being spread evenly and compacted. Top soil disturbed during the development of sites are used to restore the surface of the platform. Infertile and rocky material are carefully used as fill for S/S and TT/EP foundations. Additional soil is utilized to maintain plain area. Moreover, the project is being implemented in plain area only and hence, possibility of erosion hazard is not anticipated from any of the project site.

5.3.5 Environmental aesthetics

Since spacing between each TT in case of 132 kV D/C TL is approx. 300 mt and between each EP in case of 33/11 kV DL is approximately 100 mt. This helps to nullify the affect of the visual aesthetics of the localities particularly when it is ensured to route the lines as far as away from the localities. TSECL takes up plantation of trees to buffer the visual effect around its S/S and to provide better living conditions. Wherever TSECL feels it appropriate, discussions are held regularly with local Forest Department officials to determine feasibility of planting trees along roads running parallel to TLs to buffer visual effect in these areas. In addition, towers are being painted grey or green to merge with the background.

5.3.6 Noise/vibration Nuisances

The equipment installed at S/S are mostly static and are so designed that the noise level always remains within permissible limits i.e., 85 dB as per Indian standards. The noise levels reported during normal operating conditions are about 60 to 70 dB at 2 m. distance from the equipment. To contain the noise level within the permissible limits whenever noise level increases beyond permissible limits, measures like providing sound and vibration dampers and rectification of equipment are undertaken. In addition, plantations of sound absorbing

species like Casuarinas, Tamarind, and Neem are raised at the S/S that reduce the sound level appreciably. DG set with proper enclosures is part of equipment specification/ design criteria. Some noise is unavoidable during construction phase like noise produced by concrete mixing equipment and excavators which are temporary and only in day time. However, regular monitoring by IA/Contractors and due maintenance of equipment are ensured to keep the noise level well within the prescribed limit. **Please Refer Appendix A under heading A.**

5.3.7 Blockage of Wildlife passage

The proposed TLs don't pass through any PA and no migration paths of wildlife like elephant corridor exist near to subproject project locations hence possibility of any disturbance to wild life is not anticipated. In the instant scheme portion of 132 KV D/C Kailasahar Dhumachhera TL is passing at a distance of 4.8 km from the boundary of Rowa WLS and hence do not cause any adverse impact on wildlife. Necessary Forest clearance are obtained with stipulated specific conditions. The conditions are being implemented on site to avoid impact on wildlife environment. Also, the compliances are regularly submitted to permission Authority with site specific periodic monitoring report. The necessary provisions of bird guard and anti-perch device presented in **Annexure 14.**

5.4 Environmental Problems during Construction Phase

5.4.1 Uncontrolled silt runoff

During construction, maximum 108 m³ from each tower foundation and 7500m³ of excavated materials for each S/S foundation are expected to be generated. However, adequate measures are taken to store excavated materials properly for refilling after construction is over. In hill slopes and erosion prone soils, internationally accepted engineering practices including bio-engineering techniques, wherever, feasible are undertaken to prevent soil erosion. Moreover, excavation in the hilly areas is avoided in rainy days. Hence, uncontrolled silt run off is not anticipated.

As discussed in the earlier section, the terrain of the project area is 50 to 60% hilly and 40 to 50% plain. Majority of tower/pole locations are on plain terrain. Wherever the tower has been positioned on hilltops leg extension is being utilized so as to minimize/ avoid benching/ revetment and to provide great stability.

Retaining walls are also being constructed to eliminate the chances of silt runoff/ soil erosion. The excavated material has been backfilled and any remaining earth has been spread around the base and compacted. In case of DLs all the excavated soil is backfilled and compacted after erection of tubular poles.

It has been observed that most of these S/S lands were secured by TSECL since long back. As these substation locations are easily accessible with existing metal roads construction of new approach road is not required. The details of requirement of approach road along with google map photos of substations depicting status of approach have been placed at **Table 2.32 and Map 2.27 (page 90-100)**. However, it is to submit that in few cases i.e., 150m approach road at 132/33 kV S/S Ambassa, 25m approach road at 33/11kV Jawaharnagar, 5m each at 33/11 kV 82 Mile and 33/11kV Dhumachhera only strengthening/upgradation work of existing road will be / being undertaken to facilitate movement of construction materials and machineries to the construction sites of S/S in consultation with local authority and villagers. Since these

S/S are in plain area and no cutting and filling or used of heavy machineries involved the anticipated impacts will be negligible. IA officials have confirmed that all necessary measures like sprinkling of water, minimum disturbance to local community shall be undertaken during construction work. Further, we have been informed that a separate screening/assessment report for all proposed approach roads under NERPSIP being complied by IA and same shall be submitted to World Bank shortly.

As already explained, during construction limited quantity of excavated material is generated from tower/pole foundations and sub-station foundation. However, adequate measures have been taken to store excavated materials properly for refilling after construction is over. Further, excavation in the hilly areas is avoided in rainy days. Hence, uncontrolled silt run off is not anticipated. However, during construction, precautions are being taken by contractors, boundary/ retaining/ breast walls are being constructed to avoid any such runoff of excavated material from the construction sites. Moreover, S/S are being constructed above the highest flood level (HFL) by raising the foundation pad, therefore, are not prone to flooding/erosive losses of soil.

So far there are no instances with potential of erosion during construction of above said lines. Similarly, there are no instances of erosion/losses of soils into adjoining area as all the overburden is being backfilled within the S/S boundary walls and properly managed. The S/S are not located in the vicinity of water bodies or ecologically sensitive areas.

5.4.2 Nuisance to nearby properties

While selection of site, due care is taken to keep the TLs and S/S away from settlements. Further, all the construction activities undertaken through the use of small mechanical devices e.g., tractors and manual labor, therefore nuisance to the nearby properties if any, is not expected. Since all construction related activities for new S/S are confined to existing S/S which are already inaccessible for general public due to its separation/demarcation by the boundary wall. Moreover, such areas are declared as prohibited for general public as per the provisions of Electricity Act 2003. Hence, any adverse impact arising during the construction of these S/S are temporary and limited to the boundaries of existing S/S only and do not intend to impact on nearby habitat/property and health & safety of neighboring community.

5.4.3 Dust emission due to construction activities & vehicular movements

Exposed soils are compacted easily for prevention of dust emission due to construction activities. Sprinkling of water spray vulnerable area and covering transporting vehicles to avoid spillage of materials along with controlled speed measures have been observed in project site. Use of personal protective equipment by workers is observed. Proper scheduling of transportation of materials are being undertaken to minimize and mitigate any adverse impact on construction materials. Regular water sprinkling is being carried out at construction sites and hence dust emission impacts are not observed.

5.4.4 Interference with utilities and traffic and blockage of access way

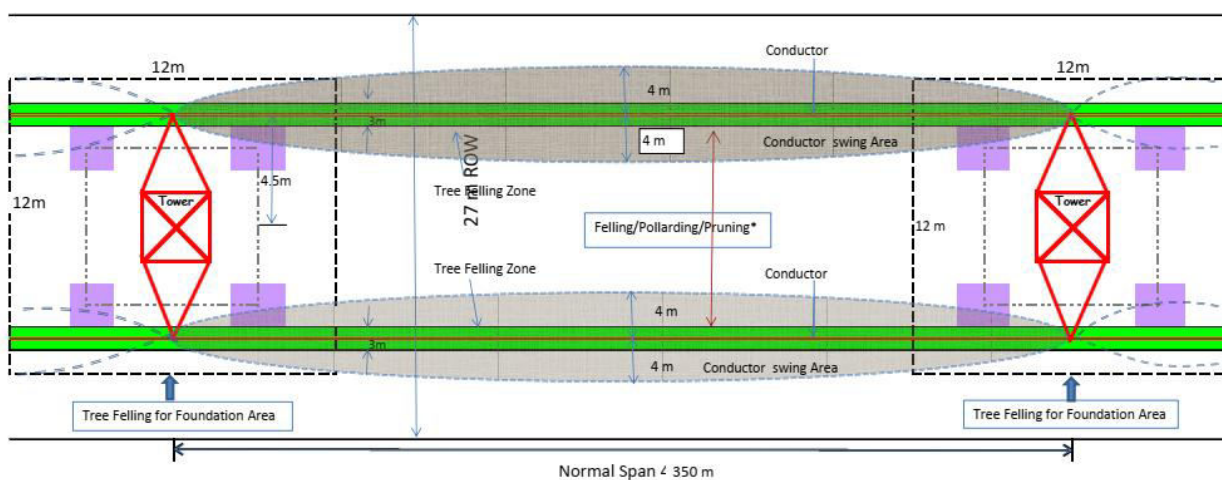
Since all the locations of subprojects are not well connected through rail link, transportation of construction materials is mostly through road network. However, in environmental sensitive area like forest, transportation is planned mostly through head load. The necessary permission with all the activities proposed for the construction of S/S is obtained as described

in the earlier sections. Access to the remote sites are along existing roads or village paths; minor improvements to paths may be made where necessary, but no major construction of roads is necessary either during construction or as a part of maintenance procedures.

In case access road/path is not available than existing field/bund is utilized after paying due compensation for any damage to crop or field. However, the requirement of new access road through forest area including tree felling the same is included in forest proposal in consultation with forest department as per provisions of Forest (Conservation) Act, 1980. However, in case tree felling is not required in access road in forest area, the permission for the same is to be obtained from concerned DFO in accordance with MoEF&CC circular dated 7th October, 2014.

In case access road/path is not available than existing field/bund may be utilized after paying due compensation for any damage to crop or field. However, in case requirement of new access road through forest area including tree felling the same is to be included in forest proposal in consultation with forest department as per provisions of Forest (Conservation) Act, 1980. However, in case tree felling is not required in access road in forest area, the permission for the same is to be obtained from concerned DFO in accordance with MoEF&CC circular dated 7th October, 2014.

POWER GRID CORPORATION OF INDIA LIMITED
(A Government Of India Enterprise)
SCHMATIC DIAGRAM FOR INDICATING AREA OF INFLUENCE/IMPACT for 132 KV D/C Transmission Line



Note : Tree felling in 3m wide corridor/zone below each conductor is applicable in forest area only.

As and when a TL crosses any road/ railways line, adequate care/caution is taken so as not to cause any hindrance to the movement of traffic. Stringing at the construction stage is carried out during lean traffic period in consultation with the concerned authorities and angle towers are planted to facilitate execution of work in different stages. Apart from this, safety precaution like barricading of work area and placement of visible signage is being undertaken to avoid any unforeseen incident.

5.4.5 Noise generation from construction activities

Generally, machineries and vehicular movements generate noise during construction activities. It has been found that construction works at S/S are potential to generate noise levels higher than the background noise as compared to construction activity of lines. Since

construction sites are quite far from settlement/other sensitive receptors like school, hospitals, possibility of any direct impact to surrounding community is not anticipated. Moreover, all these activities are being undertaken during day time only.

To prevent any adverse impact, staffs/workers engaged in construction activity are equipped with personal protective equipment like earmuffs/ earplugs Besides; construction techniques like use of low noise producing equipment /machinery selection and their proper maintenance of equipment/machinery are practiced by construction contractors which is also evident from the fact that noise levels reported/ measured during site visit are well within the prescribed limits. Regular noise level monitoring is being carried out by Construction Contractor.

5.4.6 Inadequate resurfacing for erosion control

Since, the towers for the proposed T&D lines are to be constructed in plain area as well as hilly area due care is being taken to control erosion. If due to terrain at some points towers are placed on slopes and erosion prone soils, internationally accepted engineering practices including bio-engineering techniques wherever feasible are being undertaken to prevent soil erosion. This include cutting and filling slopes wherever necessary. The back cut slopes and downhill slopes are treated with revetments. As explained above adequate steps are being taken to resurface the area after construction. Wherever sites are affected by active erosion or landslides, both biological and engineering treatment is carried out, e.g., provision of breast walls and retaining walls, toe wall, revetment wall, stone pitching, guard wall, sowing soil binding grasses around the site. Additionally, one recharge pit is proposed and being implemented at each S/S location.

Further, construction is generally undertaken in dry/non-monsoon period. The details of erosion control measures / slope protection work are provided in **Table 5.3** and **Figure 5.8**. The progress of boundary / retaining wall as on date is explained in **Table 5.4**. Also Refer **Annexure 15 for Drawing**.

Table 5-3: Erosion Control / Slope Protection Work – Proposed Locations

Description	Location
Retaining Wall	Manu S/s
Boundary Wall	All 132/33kV S/s Except Ambassa (Extn.) All 33/11kV S/s

Table 5-4: Status of Erosion Control / Slope Protection Work – DL S/S



Sr. No.	Location Name	Progress
1.	32/33 kV Ambassa-33/11kV Jawahar Nagar 33 kV	Not Yet Started
2	132/33 KV S/S at Dharma Nagar	Not Yet Started
3	2 x 50 MVA, 132/33 kV new S/S at Manu	110 RM boundary wall amongst 500 RM is completed.
4	132/33 KV S/S at Ambassa.	Completed
5	2x5 MVA, 33/11 kV new S/S at Jawahar Nagar	235 RM boundary wall amongst 240 RM is completed.
6	2x5 MVA, 33/11 kV new S/S at Dhumachhera	Not Yet Started
7	2x5 MVA, 33/11 kV new S/S at 82 Mile	178 RM boundary wall amongst 201 RM is completed.
8	2x5 MVA, 33/11 kV new S/S at Tilla Bazar	Not Yet Started
9	2x5 MVA, 33/11 kV new S/S at Durgachowmohni	198.7 RM boundary wall amongst 198.7 RM is completed.
10	Establishment of 33/11 KV S/S at Chailengta	60 RM boundary wall amongst 240 RM is completed.

The following photo shows boundary wall construction to avoid run off of the soil.

Figure 5-8: Erosion Control Measures

Retaining Wall at 132/33 kV Manu S/S



Boundary Wall	
Boundary wall at Manu substation to avoid silt runoff	Boundary wall at Jawahar Nagar substation to avoid silt runoff
	

5.4.7 Inadequate disposition of borrow area

The TW/TP foundations involve excavations on small scale basis and the excavated soil is utilized for back filling. The S/S selected on the sites in such a manner that the volume of cutting is equal to volume of filling avoiding borrowing of the area. Surplus earth/soil not generated up till now from any of the EHV or DMS S/S. If generated, soil is being utilized within S/S premises either for approach road construction or may be used for backfilling excavated pits. As such acquisition/opening of borrow area is not needed. Following is the example photo of a distribution line showing pole base, which requires very less space.



5.4.8 Protection of Worker's health/safety

All health and safety issues and its management aspects are integral part of project/contract specific safety plan which is also part of contract condition. Please refer a sample Agreement pertaining to the same in **Annexure – 16**. Various aspects such as work and safety regulations, workmen's compensation, insurance are adequately covered under the General Conditions of Contract (GCC), a part of bidding documents. Project is executed as per the approved plan and is regularly monitored by dedicated Safety personnel. Moreover, for strict compliance of safety standard/plan a special provision as a deterrent has been added in the contract which provides for a heavy penalty of Rs.10 lakhs for each accidental death and Rs.1.0 lakh/each for any injury and is deducted from the contractor's payment and paid to the deceased/affected family (**Annexure – 17**).

The project authority ensures that all contractors are operating with valid labour license as per provision under section – 12(1) of the Contract Labours (Regulation & Abolition) Act, 1970 and also certified under Section- 7(3) of the Building and Other Construction Workers (Regulation of Employment and Condition of Service) Act, 1996 from Ministry of Labour & Employment. Besides, the contractors have obtained requisite insurance policy as per provisions of Employee Compensation Act, 1923 for its employed workforce. Sample copy of labour license and insurance policy for workers is attached as **Annexure-18**.

TSECL maintains safety as a top priority and has framed guidelines/checklist for workers' safety as its personnel are exposed to live EHV apparatus and TLs. These guidelines / checklists include work permits and safety precautions for work on the TLs both during construction and operation and is regularly monitored by site in-charge. Sample copy of filled in checklist is enclosed as **Annexure-19**. Site inspection is regularly executed on sites by HSE team to ensure the measures implemented and workers health is taken care of.

In addition, training is imparted to the workers in firefighting and safety measures. Standard safety tools like helmet, safety belt, gloves etc. are provided to them in accordance to the provisions of Safety Rules. First aid facilities are made available with the labor gangs, and doctors called in from nearby towns when necessary. Efforts are being made to hire labourers locally to the extent possible, else same have been outsourced. The workers have been provided with PPEs such as boots and helmets. Mock drills such as fire safety, first aid etc. are conducted periodically to enhance the preparedness level of the workforce.

The number of outside (skilled) laborers are quite small, of the order of 25-30 people per group and remaining workforce of unskilled laborers are comprised of mostly local people. Workers are also covered by the statutory Workmen (Compensation) Act. Regular health checkups are conducted for construction workers. The construction sites and construction workers' houses are regularly disinfected. In order to minimize/checking of spread of socially transmitted diseases e.g., HIV/AIDS etc. TSECL regularly conduct awareness building programs on such issues for the construction workers.

Work sites and quarters were fumigated to avoid Covid 19 risk to the workers. Awareness program on Covid 19 at S/S was carried out by the construction contractor to prevent Covid 19 infections. Distribution of essential food materials at S/S was done during lockdown period. Photos of health and safety measures taken at the work sites are as follows:

Disinfection at the residence of workers & use of sanitizers by workers**Covid-19 measures taken at the worksites for workers health and safety**

Status of Toilet facility &HSE in Construction camps

NERPSIP project encourage employment of the local labours, thus construction camps are unavailable at sites. However, rest rooms are available at sites for use of employed labours during lunch hours.

Soak pit toilets constructed by the contractor for staffs, labours & their families (separately for Gents & Ladies) at almost all 132/33kV & 33/11kV S/S under NERPSIP-Tripura prior to the commencement of the construction activity.

Figure 5-9: Precautions Taken by the Contractor for Health and Safety of Workers

Safe Work Practices in different States/Sites during reporting period





First Aid & Fire Safety Training





Medical Health Check Up





Covid Awareness

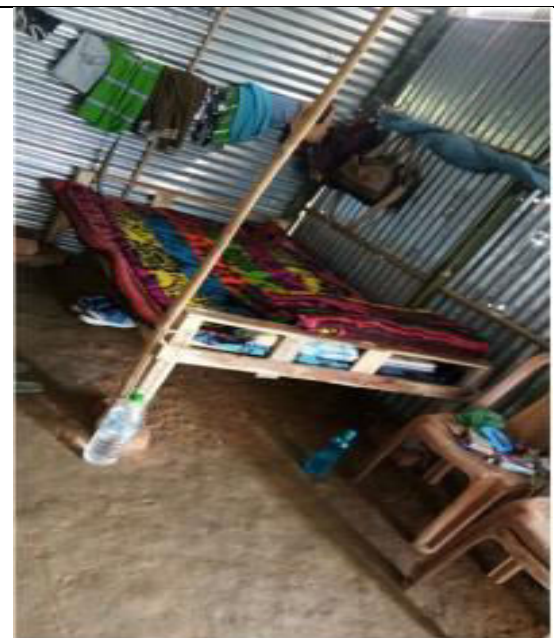




Training on Safety in general including Excavation & Soil management



Construction Camp



**Soak-pit Toilet at 132/33kV**

5.5 Environmental Problems Resulting from Operation

5.5.1 O&M Staff/Skills less than acceptable resulting in variety of adverse effects

The O& M program is normally implemented by S/S personnel for both the lines as well as S/S. Monitoring measures employed include patrolling and thermo- vision scanning.

The supervisors and managers entrusted with O&M responsibilities are intensively trained for necessary skills and expertise for handling these aspects. A monthly preventive maintenance program is carried out to disclose problems related to cooling oil, gaskets, circuit breakers, vibration measurements, contact resistance, con- denser, air handling units, electrical panels and compressors. Any sign of soil erosion is also reported and rectified. Monitoring results are published monthly, including a report of corrective action taken and a schedule for future action.

TSECL follows the best international practices while designing its system to maintain acceptable prescribed EMF level. The approved international standards and design, which The ICNIRP guideline for the general public (up to 24 hours a day) is a maximum exposure level of 1,000 mG or 100T. Further, because of issues relating to need to ensure health and safety relating to the line such as fire safety, safe voltages on metallic parts of buildings, and safety clearances to avoid flashover, the TLs do not pass directly over any residential properties and as such the potential for EMF effects to occur are further diminished. All the S/S are being constructed following the Sustainable Building norms and construction manual.

Poly Chlorinated Biphenyls (PCBs) due to their high heat capacity, low flammability and low electrical conductivity were extensively used as insulating material in capacitors and transformers. But after the finding that these PCBs are non-biodegradable and have carcinogenic tendency, its use in electrical equipment as insulating medium has been banned all over the world long back. However, it has been reported in some studies that chances of contamination of oil with PCB is possible. Keeping that in mind, TSECL has discontinued procurement electrical equipment containing PCB more than 2 mg/kg and specification (as per IEC 61619 or ASTM D4059) is being stated in the tender document. Moreover, the subject scheme doesn't involve replacement of any PCB containing equipment; hence no disposal of such equipment is anticipated.

5.6 Critical Environmental Review Criteria

5.6.1 Loss of irreplaceable resources

The T&S projects do not involve any large-scale excavation. In TL land is affected to the extent 25.5 sq. m below the tower base for which compensation is paid to land owner. **Please refer Chapter 4 and Table 4.11.** However, the subject TLs are passing through only 5.8 km of forest area out of total line length of 63.33 km. However, as per regulation and Forest Clearance obtained (**Annexure 5**), afforestation is being undertaken on double the area diverted which eventually will help in increase the forest cover.

5.6.2 Accelerated use of resources for short-term gains

TSECL do not intend to use any natural resources occurring in the area during construction as well as maintenance of ready sub projects. The construction material such as tower members, cement etc., are procured from factories while the excavated soil is being utilized for backfilling to restore the surface / filling of tower foundations. During construction of TL very small quantity of water is required which is met from nearby existing authorized source and through tanker. However, for S/S mostly ground water is used by installing a bore well during construction as well as for Operational stage. Moreover, provision of rain water harvesting in all proposed S/S by installing recharge pits under the present scheme has been made to conserve precious water resource and enhance the ground water level. Hence it may be seen that the activities associated with implementation of subject project do not intend to cause any accelerated use of resources for short term gains.

5.6.3 Endangering of species

As described earlier, only Aegle marmelos which is near threatened species as per Conservation Status IUCN (2020.1) is recorded in the TL area. However, no tree cutting is executed of these species and stipulated conditions in forest clearance are followed strictly.

5.6.4 Promoting undesirable rural-to urban migration

The subprojects do not cause any submergence or loss of land holdings that normally trigger migration. It also do not involve acquisition of any private land holdings. Hence, there is no possibility of any migration.

5.7 Public Consultation:

Public consultation/information is an integral part of the project implementation. Public is informed about the project at every stage of execution. During survey also TSECL site officials meet people and inform them about the routing of TLs. During the construction, every individual, on whose land tower is erected and people affected by RoW, are consulted. Apart from organizing many informal group meetings in different villages public meeting were also organized in the routes of TLs along with the photographs. To get the maximum participation during the public consultation Program a notice was served well in advance to the villagers. The details of line and its importance were explained to the villagers.

Apart from this, public consultation using different technique like Public Meeting, Small Group Meeting, Informal Meeting are also carried out during different activities of project cycle. During such consultation the public are informed about the project in general and in particular about the following:

- Complete project plan (i.e., its route and terminating point and S/S, if any, in between);
- Design standards in relation to approved international standards;
- Health impacts in relation to EMF;
- Measures taken to avoid public utilities such as school, hospitals, etc.;
- Other impacts associated with TLs and TSECL approach to minimizing and solving them;
- Compensation process for trees and crop damages.

In the instant project many group meetings were organized (informally and formally) in different villages where the interventions are likely to happen. Village women folk have actively participated in these meetings. During the Public consultation the details of line and its importance were explained to the villagers by the officials of TSECL and POWERGRID. The consultation was arranged in interactive way and queries like tree/crop compensation, engagement of local people in construction activity, etc. were replied. The initiative was appreciated by the villagers and they assured to extend their cooperation for construction of the said subprojects. The process of such consultation shall continue during project implementation and even during O&M stage. Details of public consultation mentioned in **Appendix C**.

Apart from organizing many informal group meetings in different districts public meeting were also organized in the routes of TLs. To get the maximum participation during the public consultation Program a notice was served well in advance to the villagers. The details of line and its importance were explained to the villagers. The programmes are arranged in interactive way and queries like crop compensation, route alignment etc. were replied. Most of the participants were small farmers and were worried about their land through which the line is passing. They were informed that TSECL and POWERGRID don't acquire their land for construction of TLs.

Only towers are to be spotted in their fields where they can do farming without any fear because the tower height is very high and even tractor can pass below the tower. Moreover, there is no risk of passing current from the above line as there is foolproof system of earthing for tower. The

consultation process was appreciated by the villagers. They were happy to know about the transparent policy of TSECL and POWERGRID for execution of the project and promised to extend their cooperation during construction of the line. The process of such consultation and its documentation shall be continued even during O&M stage.

Findings of public consultation:

1. People are well aware about the project, its various components and confirmed that IA & TSECL informed about the project at every stage of execution
2. People confirmed that IA & TSECL are taking every step possible to avoid/ minimize the environmental and social impacts along the route of TLs and at site of sub stations.
3. People confirmed that community reserves, sacred groves and community conserved areas are completely avoided while finalizing the route of lines
4. People also confirmed that their common property resources such as cemetery, school, community hall, habitation areas etc. have been completely avoided while finalizing the route of lines.
5. People informed that staff of IA/ contractor are easily approachable and are very open to address their grievances. As a result, no written grievance has been received till date.
6. People are very much happy with the rate of compensation being given to them and they are being involved in the process of deciding the rate of compensation.
7. People confirmed that there is no disturbance of any sort to their life/ livelihood due to the construction or various other activities being carried out under the project.
8. Execution of project work provides opportunities to local contractors to get involved in construction, fabrication, transportation etc. activities.
9. Most of the sub-contracts are awarded/ being awarded to local peoples.
10. Contractor prefer and engage local peoples for skilled and unskilled works
11. Local villagers rented out their buildings to contractor and IA for temporary offices and staff quarters in local that helps in income generation
12. Wherever possible contractor and IA purchase daily need requirements for local vendors and shopkeepers that helps in economic upliftment of the area
13. The contractor labor informed that they have been provided with PPEs such as boots and helmets.
14. Mock drills such as fire safety, first aid etc. are conducted periodically to enhance the preparedness level. Safety induction & awareness program including HIV/AIDS are also conducted. Safety film for transmission project in local language is shown for better awareness.
15. First aid boxes and provisions for treatment in case of emergencies are arranged locally/ nearby towns
16. It was revealed that contractor and IA work with close coordination with village heads and community to avoid any misunderstanding during work.

5.8 Compliance of EMP

The IA has a continuous monitoring mechanism of the project w.r.t. compliance of the mandatory requirements as stipulated in the IEAR. As many provisions of EMP related to construction contractor, EMP has been made integral part of contract document for its proper implementation on site. Thus, the adherence to the clauses by the contractor is regularly monitored especially in respect of various implementation E & S measures including health and safety aspects. As part of the present study, mitigation measures as stipulated in the IEAR have been critically assessed/evaluated for compliance through physical inspection, verification of record / documents / drawing, interaction with project officials / contractor / villagers / construction workers and PRA etc. Based on above, a detailed compliance status w.r.t. each identified impacts enlisted in EMP have been prepared and is presented in the **Table 5.5**.

Table 5-5: Environment Management Plan and Compliance

Clause No.	Project Activity /Stage	Potential Impact	Proposed Mitigation Measures	Parameter to be Monitored	Measurement & Frequency	Institutional Responsibility	Implementation Schedule	Compliance Report
Pre-construction								
1	Location of overhead line towers / poles/ underground distribution lines and alignment & 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.	Tower location and overhead/ underground alignment selection with respect to nearest dwellings	Setback distances to nearest houses – once	Implementing Agency (IA)	Part of overhead lines tower/ poles/ laying of underground cable site survey and detailed alignment survey and design	Careful route alignment had ensured that no house/ dwelling unit is coming in the RoW.
2	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	PCBs not used in substation transformers or other project facilities or equipment.	Transformer design	Exclusion of PCBs in transformers stated in tender specification – once	IA	Part of tender specifications for the equipment	Compiled and included in tender document with technical specification.
			Processes, equipment and systems not to use chlorofluorocarbons (CFCs), including halon, and their use, if any, in existing processes and systems should be phased out and to be disposed of in a manner consistent with the requirements of the Government	Process, equipment and system design	Exclusion of CFCs stated in tender specification – once Phase out schedule to be prepared in case still in use – once	IA	Part of tender specifications for the equipment Part of equipment and process design	Compiled and included in tender document with technical specification. Included in process design and its part of equipment specification.
3	Transmission/ Distribution line design	Exposure to electromagnetic interference	Line design to comply with the limits of electromagnetic interference from overhead power lines	Electromagnetic field strength for proposed line design	Line design compliance with relevant standards once	IA	Part of design parameters	Designs are in compliance with international standards as certified by PTI, USA, CPRI Bangalore
4	Substation location and design	Exposure to noise	Design of plant enclosures to comply with noise regulations.	Expected noise emissions based on substation design	Compliance with regulations - once	IA	Part of detailed siting survey and design	Designs are in Compliance with minimal noise and

Clause No.	Project Activity /Stage	Potential Impact	Proposed Mitigation Measures	Parameter to be Monitored	Measurement & Frequency	Institutional Responsibility	Implementation Schedule	Compliance Report
								acoustics with international standards as certified by PTI, USA, CPRI Bangalore
		Social inequities	Careful selection of site to avoid encroachment of socially, culturally and archaeological sensitive areas (i.e., sacred graves, graveyard, religious worship place, monuments etc.)	Selection of substation location (distance to sensitive area).	Consultation with local authorities/ autonomous councils - once	IA	Part of detailed siting survey and design	Complied
5	Location of overhead line towers/poles/ laying of underground distribution line & alignment and design	Impact on water bodies	Avoidance of such water bodies to the extent possible. Avoidance of placement of tower inside water bodies to the extent of possible	Tower/pole location and overhead/ underground line alignment selection (distance to water bodies)	Consultation with local authorities- once	IA	Part of tower/pole site survey and detailed underground /overhead line alignment survey and design	Careful route selection and provision of adequate extensions has avoided the habituated area to the extent possible.
Social inequities		Careful route selection to avoid existing settlements and sensitive locations	Tower/pole location and overhead/ underground line alignment selection (distance to nearest dwellings or social institutions)	Consultation with local authorities/ autonomous councils and land owners - once	IA	Part of detailed tower/pole site and overhead/ underground alignment survey and design		
		Minimise impact on agricultural land Careful selection of site and route alignment to avoid encroachment of socially, culturally and archaeological sensitive areas (e.g. graveyard, religious	Tower location and overhead underground line alignment selection (distance to agricultural land) Tower/pole location and overhead/	Consultation with local authorities/ autonomous councils and land owners - Once Consultation with local authorities/ autonomous councils - once				Transmission (132/33kV) and Distribution (33/11kV) lines are routed either age of agriculture land or side of the road ensuring that it does not obstruct and create any public nuisance

Clause No.	Project Activity /Stage	Potential Impact	Proposed Mitigation Measures	Parameter to be Monitored	Measurement & Frequency	Institutional Responsibility	Implementation Schedule	Compliance Report
			worship place, monuments etc.)	underground line alignment selection (distance to sensitive area)				
6	Securing lands for substations.	Loss of land/income change in social status etc.	Compensation and R&R measures are extended as per provision of RFCT LARR Act, 2013 (Right to Fair Compensation and Transparency in Land Acquisition, Resettlement and Rehabilitation Act, 2013)	Compensation and monetary R&R amounts/ facilities extended before possession of land.	As per provisions laid out in the act	State Govt.	Prior to award/start of substation construction.	No cases of R&R. Other compensation as per existing rules.
7	Line through protected area/precious ecological area	Loss of precious ecological values / damage to precious species	Avoid siting of lines through such areas by careful site and alignment selection (NP/ WLS / Biodiversity Hotspots)	Tower/pole location and overhead/ underground line alignment selection (distance to nearest designated ecological PA areas)	Consultation with local forest authorities - once	IA	Part of detailed site selection and alignment survey /design	Complied Stage II clearance is obtained Working permission is obtained on 7 th June 2019 for Kailasahar-Dharmanagar 132 KV D/C line. Stage-I clearance issued on 2 nd March 2021 and Working permission obtained on 10 th May 2021 for 132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line 33 kV Jawaharnagar - Dhumachera line- Stage-I issued on 28.06.2021

Clause No.	Project Activity /Stage	Potential Impact	Proposed Mitigation Measures	Parameter to be Monitored	Measurement & Frequency	Institutional Responsibility	Implementation Schedule	Compliance Report
			Minimize the need by using RoW wherever possible	Tower/pole location and overhead/underground line alignment selection	Consultation with local authorities and design engineers - once	IA	Part of detailed site selection and alignment survey /design	Complied
8	Line through identified Elephant corridor / Migratory bird	Damage to the Wildlife/ Birds and also to line	Study of earmarked elephant corridors to avoid such corridors, Adequate ground clearance, Fault clearing by Circuit Breaker, Barbed wire wrapping on towers, reduced spans etc., if applicable	Tower/pole location and overhead/underground line alignment selection. Minimum/maximum ground clearance	Consultation with local forest authorities - once. Monitoring - quarterly basis	IA	Part of detailed site selection and alignment survey /design and Operation	There is no elephant corridor in the selected route.
			Avoidance of established/ identified migration path (Birds & Bats). Provision of flight diverter/reflectors, bird guard, elevated perches, insulating jumper loops, obstructive perch deterrents, raptor hoods etc7., if applicable	Tower/pole location and overhead/underground line alignment selection	Consultation with local forest authorities - once	IA	Part of detailed site selection and alignment survey /design and Operation	Complied, Bird guards are being provided in towers.
9	Line through forestland	Deforestation and loss of biodiversity edge effect	Avoid locating lines in forest land by careful site and alignment selection Minimize the need by using existing towers, tall towers and RoW, wherever Possible Measures to avoid	Tower/pole location and overhead/underground line alignment selection (distance to nearest protected or reserved forest) Intrusion of invasive	Consultation with local authorities - once Consultation with local authorities and design engineers - once Consultation with	IA	Part of detailed site selection and alignment survey/design	Minimum tree cutting is done. The shrubby vegetation is retained as it is. Wherever tree cutting is necessary, it was done under supervision of forest department. Complied

Clause No.	Project Activity /Stage	Potential Impact	Proposed Mitigation Measures	Parameter to be Monitored	Measurement & Frequency	Institutional Responsibility	Implementation Schedule	Compliance Report
			invasion of alien species	species	local forest authorities - once			
			Obtain statutory clearances from the Government	Statutory approvals from Government	Compliance with regulations – once for each subproject			Stage II clearance is obtained Working permission is obtained on 7 th June 2019 for Kailasahar-Dharmanagar 132 KV D/C line. Stage-I clearance issued on 2 nd March 2021 and Working permission obtained on 10 th May 2021 for 132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line. 33 kV Jawaharnagar - Dhumachera line- Stage-I issued on 28.06.2021
			Consultation with autonomous councils wherever required	Permission/ NOC from autonomous councils	Consultation with autonomous councils – once during tower placement			Not Applicable
10	Lines through farmland	Loss of agricultural production/ change in cropping pattern	Use existing tower or Footings wherever possible.	Tower/pole location and overhead/ underground line alignment selection.	Consultation with local authorities and design engineers – once	IA	Part of detailed alignment survey and design	Foundations cast during lean period to avoid damage to the crops during harvesting.
			Avoid sitting new towers on farmland wherever feasible	Tower/pole location and overhead/ underground line alignment selection	Consultation with local authorities and design engineers – once		Part of detailed sitting and alignment survey /design	Due care taken to avoid the damage to the extent possible.
11	Noise related	Nuisance to neighboring	Substations sited and designed	Noise levels	Noise levels to be specified in tender	IA	Part of detailed equipment design	Complied, Appropriately located.

Clause No.	Project Activity /Stage	Potential Impact	Proposed Mitigation Measures	Parameter to be Monitored	Measurement & Frequency	Institutional Responsibility	Implementation Schedule	Compliance Report
		properties	to ensure noise is to not be a nuisance		documents – once			No noise anticipated
12	Interference with drainage patterns/ irrigation channels	Flooding hazards/ loss of agricultural production	Appropriate siting of towers to avoid channel interference	Tower/pole location and overhead/ underground line alignment selection (distance to nearest flood zone)	Consultation with local authorities and design engineers – once	IA	Part of detailed alignment survey and design	No substation or towers are located in the natural drainage or irrigation channels. All the towers and Poles and S/S are designed and constructed at desired elevation above flood level.
13	Escape of polluting materials	Environmental pollution	Transformers designed with oil spill containment systems, and purpose-built oil, lubricant and fuel storage system, complete	Equipment specifications with respect to potential pollutants	Tender document to mention specifications – once	IA	Part of detailed equipment design /drawings	Spill control plan is ready and no spilled material is going / will go out of S/S due to provision secondary containment. All transformers are well built with oil pits. Hazardous management, storage and handling rules 2016 are adhered to.
			Substations to include drainage and sewage disposal systems to avoid offsite land and water pollution.	Substation sewage design	Tender document to mention detailed specifications – once	IA	Part of detailed substation layout and design/drawings	Spill control plan is ready and no spilled material is going / will go out of S/S due to provision secondary containment. Internal drainage and sewerage system are well planned and implemented at all S/S.
14	Equipment's	Contaminati	Substations	Substation design to	Base height as per	IA	Part of detailed	S/S constructed above

Clause No.	Project Activity /Stage	Potential Impact	Proposed Mitigation Measures	Parameter to be Monitored	Measurement & Frequency	Institutional Responsibility	Implementation Schedule	Compliance Report
	submerged under flood	on of receptors	constructed above the high flood level(HFL) by raising the foundation pad	account for HFL (elevation with respect to HFL elevation)	flood design- once		substation layout and design/drawings	the high flood level (HFL) by raising the foundation pad and the surface run off is directed along with the boundary of the S/S
15	Explosions /Fire	Hazards to life	Design of substations to include modern firefighting equipment	Substation design compliance with fire prevention and control codes	Tender document to mention detailed specifications - once	IA	Part of detailed substation layout and design /drawings	Complied, adequate numbers of fire extinguishers are provided being planned in lean period or avoided during harvest
			Provision of firefighting equipment to be located close to transformers					Complied, the fire extinguishers are placed at strategic locations.
Construction								
16	Equipment layout and installation	Noise and vibrations	Construction techniques and machinery selection seeking to minimize ground disturbance.	Construction techniques and machinery	Construction techniques and machinery creating minimal ground disturbance- once at the start of each construction phase	IA (Contractor through contract provisions)	Construction period	Complied, Anti-vibration pad are used.
17	Physical construction	Disturbed farming activity	Construction activities on cropping land timed to avoid disturbance of field crops (within one month of Harvest wherever possible).	Timing of start of construction	Crop disturbance - Post harvest as soon as possible but before next crop - once per site	IA (Contractor through contract provisions)	Construction period	Foundation being planned in lean period or avoided during harvest.
18	Mechanized construction	Noise, vibration and operator safety, efficient	Construction equipment to be well maintained.	Construction equipment - estimated noise emissions	Complaints received by local authorities - every 2 weeks	IA (Contractor through contract provisions)	Construction period	Complied, Anti-vibration pad are used and most of the construction activities are done during day time.

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		operation						
		Noise, vibration, equipment wear and tear	Turning off plant not in use.	Construction equipment-estimated noise emissions and operating schedules	Complaints received by local authorities – every 2 weeks	IA (Contractor through contract provisions)	Construction period	Complied, Anti-vibration pad are used.
19	Construction of roads for accessibility	Increase in airborne dust particles	Existing roads and tracks used for construction and maintenance access to the line wherever possible.	Access roads, routes (length and width of new access roads to be constructed)	Use of established roads wherever possible – every 2 weeks	IA (Contractor through contract provisions)	Construction period	Existing Road used to access the line route; water sprinkling is done during additional construction activity.
		Increased land requirement for temporary accessibility	New access ways restricted to a single carriageway width within the RoW.	Access width (meters)	Access restricted to single carriage –way width within RoW – every 2 weeks	IA (Contractor through contract provisions)	Construction period	Most of the construction activity are done during day time and water sprinkling is done during additional construction activity
20	Construction activities	Safety of local villagers	Coordination with local communities for construction schedules, Barricading the construction area and spreading awareness among locals	Periodic and regular reporting /supervision of safety arrangement	No. of incidents- once every week	IA (Contractor through contract provisions)	Construction period	Construction safety procedures are followed with proper barricading with night vision
		Local traffic obstruction	Coordination with local authority/requisite permission for smooth flow of traffic	Traffic flow (Interruption of traffic)	Frequency (time span)- on daily basis	IA (Contractor through contract provisions)	Construction period	There is not any heavy traffic flow due to the construction activities and it is planned and being done only in day time
21	Temporary blockage of utilities	Overflows, reduced discharge	Measure in place to avoid dumping of fill materials in sensitive	Temporary fill placement (m3)	Absence of fill in sensitive drainage areas – every 4	IA (Contractor through contract	Construction period	There are no blockages of any utilities.

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			drainage area		weeks	provisions)		
22	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 m2)	Clearance strictly limited to target vegetation – every 2 weeks	IA (Contractor through contract provisions)	Construction period	Included in contract provisions and being monitored regularly. An area of 400 m2 is being cleared tower foundation at each location depending on the type of tower. In rest of ROW trees that are coming in the electrical clearance zone are cleared.
23	Trimming /Cutting of trees within RoW	Fire hazards	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.	Species-specific tree retention as approved by statutory authorities (average and max. tree height at maturity, in meters)	Presence of target species in RoW following vegetation clearance – once per site	IA (Contractor through contract provisions)	Construction period	Tree height and its canopy are monitored during constructions activities and there after felling coupled with other safety measures applied restrict any such incident.
		Loss of vegetation and deforestation	Trees that can survive pruning to comply should be pruned instead of cleared.	Species-specific tree retention as approved by statutory authorities	Presence of target species in RoW following vegetation clearance - once per site	IA (Contractor through contract provisions)	Construction period	Route selection and alignment is done with respect to no or minimal cuts of trees.
			Felled trees and other cleared or pruned vegetation to be disposed of as authorized by the statutory bodies.	Disposal of cleared vegetation as approved by the statutory authorities (area cleared in m2)	Use or intended use of vegetation as approved by the statutory authorities – once per site	IA (Contractor through contract provisions)	Construction period	The felled trees are disposed out to local authorities under the supervision of forest department following forest rules.
24	Wood/vegetation harvesting	Loss of vegetation And deforestation	Construction workers prohibited from harvesting wood in the project area during	Illegal wood /vegetation harvesting (area in m2, number of	Complaints by local people or other evidence of illegal harvesting – every 2	IA (Contractor through contract provisions)	Construction period	No Wood/ vegetation harvesting is allowed in substation and line area.

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		n	their employment, (apart from locally employed staff continuing current legal activities)	incidents reported)	weeks			
25	Surplus earthwork/soil	Runoff to cause water pollution, solid waste disposal	Soil excavated from tower footings/substation foundation disposed of by placement along roadsides, or at nearby house blocks if requested by landowners	Soil disposal locations and volume (m3)	Acceptable soil disposal sites - every 2 weeks	IA (Contractor through contract provisions)	Construction period	Excavated earth is used for refilling. The top/fertile soil is kept separately for resurfacing and other earth is used for refilling.
26	Substation construction	Loss of soil	Loss of soil is not a major issue as excavated soil is to be mostly reused for filling. However, in case of requirement of excess soil the same is to be met from existing quarry or through deep excavation of existing pond or other nearby barren land with agreement of local communities	Borrow area sitting (area of site in m2 and estimated volume in m3)	Acceptable soil borrow areas that provide a benefit - every 2 weeks	IA (Contractor through contract provisions)	Construction period	All necessary measured undertaken during construction.
		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(pH, BOD /COD, Suspended solids, others)	Timing of major disturbance activities - prior to start of construction activities	IA (Contractor through contract provisions)	Construction period	No such water pollution activities are carried out. Proper sewerage system and drainage system is designed and implemented at all S/S locations.
27	Site Clearance	Vegetation	Tree clearances for	Ground	Amount of	A	Construction period	Complied.

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			easement establishment to only involve cutting trees off at ground level or pruning as appropriate, with tree stumps and roots left in place and ground cover left undisturbed	disturbance during vegetation clearance (area, m ²) Statutory Approvals	ground disturbance – every 2 weeks Statutory approvals for tree clearances – once for each site	(Contractor through contract provisions) A (Contractor through contract provisions)	Construction period	Minimum trees cut for site clearance. Some trees were trimmed
28	Substation foundation/ tower erection disposal of surplus earthwork/fill	Waste disposal	Excess fill from substation/tower foundation excavation disposed of next to roads or around houses, in agreement with the local community or landowner.	Location and amount (m ³) of fill disposal	Appropriate fill disposal locations – every 2 weeks	IA (Contractor through contract provisions)	Construction period	These provisions are strictly complied and recorded during construction.
29	Storage of chemicals and materials	Contamination of receptors (land, water, air)	Fuel and other hazardous materials securely stored above high flood level.	Location of hazardous material storage; spill reports (type of material spilled, amount (kg or m ³) and action taken to control and clean up spill)	Fuel storage in appropriate locations and receptacles – every 2 weeks	IA (Contractor through contract provisions)	Construction period	Complied and condition is taken care during storage. Hazardous materials are managed by following Hazardous waste management rules 2016. Also, transformers are erected with oil pits for proper management and collection of oil.
30	Construction schedules	Noise nuisance to neighboring properties	Construction activities only undertaken during the day and local communities	Timing of construction (noise emissions, [dB(A)])	Daytime construction only – every 2 weeks	IA (Contractor through contract provisions)	Construction period	It is ensured by site In-charge that construction activities take place during day time and

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			informed of the construction schedule.					villagers are informed in advance and affected villagers are even served notice in advance and Anti-vibration pad are used.
31	Provision of facilities 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 once each new facility	IA (Contractor through contract provisions)	Construction period	Construction workers are provided all the necessary basic facilities as well as safety equipment
32	Influx of migratory workers	Conflict with local population to share local resource	Using local workers for appropriate tasks	Avoidance/reduction of conflict through enhancement / augmentation of resource requirements	Observation & supervision – on weekly basis	IA (Contractor through contract provisions)	Construction period	Local workers were employed for the construction work, so that no any conflict arose at the construction locations.
33	Lines through farmland	Loss of agricultural productivity	Use existing access roads wherever possible	Usage of existing utilities	Complaints received by local people /authorities - every 4 weeks	IA (Contractor through contract provisions)	Construction period	Crop compensation as per CPTD is given
			Ensure existing irrigation facilities are maintained in working condition	Status of existing facilities				No irrigation facilities is affected or blocked.
			Protect /preserve topsoil and reinstate after construction completed	Status of facilities (earthwork in m3)				All measures to resurface the excavated area by top soil is adopted as described above.
			Repair /reinstate damaged bunds etc after construction	Status of facilities (earthwork in m3)				Damaged bunds were repaired to normal stage
		Loss of Land owners/ farmers	Process of Crop/tree				Compensation as per	

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		Income	compensated for any temporary loss of productive land as per existing regulation	compensation in consultation with forest dept. (for timber yielding tree) and Horticulture dept. (for fruit bearing tree)				CPTD are paid.
34	Uncontrolled erosion/silt runoff	Soil loss, downstream siltation	<p>Need for access tracks minimized, use of existing roads.</p> <p>Regeneration of vegetation to stabilize works areas on completion (where applicable)</p> <p>Avoidance of excavation in wet season</p> <p>Water courses protected from siltation through use of bunds and sediment ponds</p>	Design basis and construction procedures (suspended solids in receiving waters; area re-vegetated in m ² ; amount of bunds constructed [length in meter, area in m ² , or volume in m ³])	Incorporating good design and construction management practices – once for each site	IA (Contractor through contract provisions)	Construction period	<p>All necessary measured undertaken during construction.</p> <p>Regeneration/ cultivation is allowed in the complete RoW and even in the area below tower after completion of construction activities.</p> <p>It is ensured by the site In-charge that no excavation is carried out during monsoon/rainy season.</p> <p>The selected route does not come in the natural drainage.</p>
35	Nuisance to nearby properties	Losses to neighboring land uses/values	Contract clauses specifying careful construction as much as possible existing access ways is to be reinstated following completion of	Contract clauses Design basis and layout Reinstatement of land status (area affected, m ²)	Incorporating good construction Incorporating good design engineering Consultation with affected parties – twice – immediately	IA (Contractor through contract provisions)	Construction period	Complied

Clause No.	Project Activity /Stage	Potential Impact	Proposed Mitigation Measures	Parameter to be Monitored	Measurement & Frequency	Institutional Responsibility	Implementation Schedule	Compliance Report
			construction					
		Social inequities	Compensation is to be paid for loss of production, if any.	Implementation of Tree/Crop Compensation (amount paid)	Consultation with affected parties – once in a quarter	IA	Prior to construction	Complied Tree Crop compensation is paid as per CPTD
36	Flooding hazards due to construction impediments of natural drainage	Flooding and loss of soils, contamination of receptors (land, water)	Avoid natural drainage pattern/ facilities being disturbed/blocked/ diverted by on-going construction activities	Contract clauses (e.g. suspended solids and BOD/COD in receiving water)	Incorporating good construction management practices-once for each site	IA (Contractor through contract provisions)	Construction period	The S/S and tower area at constructed at suitable elevation above HFL of the area. Hence no impact on drainage pattern due to flood
37	Equipment submerged under flood	Contamination of receptors (land, water)	Equipment stored at secure place above the high flood level(HFL)	Store room level to be above HFL (elevation difference in meters)	Store room level as per flood design-once	IA	Construction period	The S/S and tower area at constructed at suitable elevation above HFL of the area. Hence no impact on drainage pattern due to flood
38	Inadequate siting of borrow areas (quarry areas)	Loss of land values	Existing borrow sites is to be used to source aggregates, therefore, no need to develop new sources of aggregates	Contract clauses	Incorporating good construction management practices – once for each site	IA (Contractor through contract provisions)	Construction period	Complied, no such sites are selected for substation and tower location in low lying area.
39	Health and safety	Injury and sickness of workers and members of the public	Safety equipment's (PPEs) for construction workers	Contract clauses (number of incidents and total lost-work days caused by injuries and sickness)	Contract clauses compliance – once every quarter	IA (Contractor through contract provisions)	Construction period	Complied, by providing displays, PPEs and training of the contractors and contract workers. Complied. No incident of accident/injury reported All health and safety plan are in place and monitored regularly
			Contract provisions specifying minimum requirements					
			Construction camps Contractor to prepare and implement of health and safety plan.					

Clause No.	Project Activity /Stage	Potential Impact	Proposed Mitigation Measures	Parameter to be Monitored	Measurement & Frequency	Institutional Responsibility	Implementation Schedule	Compliance Report
			Contractor to arrange for health and safety training sessions					Regular briefing / training for contract workers is organized by contractor/POWERGRID
40	No Regular construction stage Environmental Monitoring training	Likely to maximise Impacts on Environment	Training of environmental monitoring personnel	Training schedules	No. of programs attended by each person – once a year	IA	Routinely throughout construction period	Periodic Environment monitoring and Training program are organized for such persons.
			Implementation of effective environmental monitoring and reporting system using checklist of all contractual environmental requirements	Respective contract checklists and remedial actions taken thereof.	Submission of duly completed checklists of all contracts for each site – once			Complied. Regular monitoring by site and Corporate is organized.
			Appropriate contact clauses to ensure satisfactory implementation of contractual environmental mitigation measures.	Compliance report related to environmental aspects for the contract	Submission of duly completed compliance report for each contract – once			All provisions are compiled and monitored regularly
Operation & Maintenance								
41	Location of line towers/poles and overhead/ underground line alignment & 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.	Compliance with setback distances (“as-built” diagrams)	Setback distances to nearest houses – once in quarter	TSECL	During operations	Designed as per guidelines of ICNIRP and ACGIH and checked by CPRI and M/s PTI, USA
42	Line through identified bird flyways,	Injury/ mortality to birds, bats	Avoidance of established/ identified migration path (Birds)	Regular monitoring for any incident of injury/mortality	No. of incidents- once every month	TSECL	Part of detailed site selection and alignment survey	Complied, Bird guards are being provided in towers.

Clause No.	Project Activity /Stage	Potential Impact	Proposed Mitigation Measures	Parameter to be Monitored	Measurement & Frequency	Institutional Responsibility	Implementation Schedule	Compliance Report
	migratory path	etc due to collision and electrocution	& Bats). Provision of flight diverter/reflectors, elevated perches, insulating jumper loops, obstructive perch deterrents, raptor hoods etc., if applicable				/design and Operation	
43	Equipment Submerged under flood	Contamination of receptors (Land, water)	Equipment installed above the high flood level (HFL) by raising the foundation pads.	Substation design to account for HFL	Base height as per flood design - once	TSECL	During operations	The area is not prone to flood, but necessary care is taken by the authorities to avoid such situations
44	Oil spillage	Contamination Of land/nearby water bodies	Substation transformers located within secure and impervious sump areas with a storage capacity of at least 100% of the capacity of oil in transformers and associated reserve tanks.	Substation bunding (Oil sump) ("as built" diagrams)	Bunding (Oil sump) capacity and permeability - once	TSECL	During operations	Oil sump of sufficient capacity (200% by volume of oil tank in transformer) is provided for every transformer. Secondary containment
44	Oil spillage	Contamination Of land/nearby water bodies	Substation transformers located within secure and impervious sump areas with a storage capacity of at least 100% of the capacity of oil in transformers and associated reserve tanks.	Substation bunding (Oil sump) ("as built" diagrams)	Bunding (Oil sump) capacity and permeability - once	TSECL	During operations	Oil sump of sufficient capacity (200% by volume of oil tank in transformer) is provided for every transformer. Secondary containment is provided

Clause No.	Project Activity /Stage	Potential Impact	Proposed Mitigation Measures	Parameter to be Monitored	Measurement & Frequency	Institutional Responsibility	Implementation Schedule	Compliance Report
45	SF6 (Sulfur hexafluoride) management	Emission of most potent GHG causing climate change	Reduction of SF6 emission through awareness, replacement of old seals, proper handling & storage by controlled inventory and use, enhance recovery and applying new technologies to reduce leakage	Leakage and gas density/level	Continuous monitoring	TSECL	During Operations	--
46	Inadequate provision of staff/workers health and safety during operations	Injury and sickness of staff /workers	Careful design using appropriate technologies to minimize hazards	Usage of appropriate technologies (lost work days due to illness and injuries)	Preparedness level for using these technologies in crisis – once each year	TSECL	Design and operation	Being Complied. In design and operation standards of safety procedure followed.
			Safety awareness rising for staff.	Training/awareness programs and mock drills	Number of programs and percent of staff / workers covered – once each year			Proper safety training to all workers and primary safety kits/PPEs are provided in every site.
			Preparation of fire emergency action plan and training given to staff on implementing emergency action plan	Provision of facilities	Complaints received from staff /workers every 2 weeks			Regular mock drills on fire and other occupational hazards are organized. Fire emergency is displayed at all substation in English and local language.
47	Electric Shock Hazards	Injury/ mortality to staff and public	Careful design using appropriate technologies to minimize hazards	Usage of appropriate technologies (no. of injury incidents, lost work days)	Preparedness level for using these technology in crisis- once a month	TSECL	Design and Operation	Electric shock emergency response plan is displayed at all substations with periodic training in local language.
			Security fences around substations	Maintenance of fences	Report on maintenance – every			Security fences around substations are provided

Clause No.	Project Activity /Stage	Potential Impact	Proposed Mitigation Measures	Parameter to be Monitored	Measurement & Frequency	Institutional Responsibility	Implementation Schedule	Compliance Report
					2 weeks			
			Barriers to prevent climbing on/ dismantling of towers	Maintenance of barriers				Barriers to prevent climbing on/ dismantling of towers provided
			Appropriate warning signs on facilities	Maintenance of warning signs				Appropriate warning signs on facilities provided
			Electricity safety awareness raising in project areas	Training /awareness programs and mock drills for all concerned parties	Number of programs and percent of total persons covered - once each year			Training /awareness programs and mock drills for all concerned parties are conducted periodically in local language.
48	Operations and maintenance staff skills less than acceptable	Unnecessary environmental losses of various types	Adequate training in O&M to all relevant staff of substations & T&D line maintenance crews. Preparation and training in the use of O&M manuals and standard operating practices	Training/awareness programs and mock drills for all relevant staff	Number of programs and percent of staff covered - once each year	TSECL	Operation	Training and educating the staffs with pictorial signage's. Induction training along with refreshers training is periodically carried out.
49	Inadequate periodic Environmental monitoring.	Diminished ecological & Social values.	Staff to receive training in environmental monitoring of Project operations and maintenance activities.	Training/awareness programs and mock drills for all relevant staff	Number of programs and percent of staff covered - once each year	TSECL	Operation	Periodical environmental monitoring is planned.
50	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	Processes, equipment and systems using chlorofluorocarbons (CFCs), including halon, should be phased out and to be disposed of in a	Process, equipment and system design	Phase out schedule to be prepared in case still in use - once in a quarter	TSECL	Operations	Provisions for collection and storage is adequate.

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			manner consistent with the requirements of the Govt.					
51	Transmission/distribution line maintenance	Exposure to electromagnetic interference	Transmission/distribution line design to comply with the limits of electromagnetic interference from overhead power lines	Required ground clearance (meters)	Ground clearance - once	TSECL	Operations	Designed as per guidelines of ICNIRP and ACGIH and checked by CPRI and M/s PTI, USA.
52	Uncontrolled growth of vegetation	Fire hazard due to growth of tree/shrub/Bamboo along RoW	Periodic pruning of vegetation to maintain requisite electrical clearance. No use of herbicides/pesticides	Requisite clearance (meters)	Assessment in consultation with forest authorities - once a year (pre-monsoon/post-monsoon)	TSECL	Operations	All necessary measures undertaken during operation.
53	Noise related	Nuisance to neighboring properties	Substations sited and designed to ensure noise is to not be a nuisance.	Noise levels {dB(A)}	Noise levels at boundary nearest to properties and consultation with affected parties if any - once	TSECL	Operations	Being Complied. Appropriately located. No noise anticipated

5.9 Conclusions:

It is clear from the above discussion that the area is rich in natural forest resources. But careful route selection following the principle of avoidance, ecologically sensitive areas like NP / WLS have been avoided completely but complete avoidance of forest could not be achieved due to terrain limitations. However, all possible efforts have been taken that line route is aligned in such a way that it involves minimum forest stretch. In the instant case the TL and DLs involving forest area of 36.686 Ha. for which adequate mitigation measure like providing funds for raising compensatory afforestation on double the area of degraded forest land are being paid by IA to State Forest department. Moreover, to reduce the impact on forest area bare minimum felling of trees are planned in RoW in the forest with meticulous planning. The infrastructural constraints are very real and pose a limiting factor on the development of the area. The above facts while on the one hand underline the need for implementation of the subject scheme for overall development of the area and on another hand suggests that a detailed EIA may not be necessary as per the provisions of existing regulations.

T&D line routes and S/S location have been selected judiciously by considering the technical, environmental, socio-economic aspects. Though some changes in line length & route alignment have been observed in T&D lines as compared to IEAR scope but as a result careful route selection IA could able to avoid ecologically & socially sensitive areas including forest, protected areas, PCR etc. completely in all the lines and S/S being implemented under this project.

The present T&D schemes not only improve overall power supply situation but also improve reliability, quality, security and enhancement of power supply in the Tripura state. From the above discussion, it would seem that the area is rich in physical resources. But careful route selection has minimized involvement of forest area to the extent possible but could not be completely avoided due to terrain and other physiographical reasons. Thus, routes selected for detailed survey are the most optimum alignment and involved minimum forest.

The provisions of IEAR & EMP are being implemented at ground level and strict compliance by construction contractors is ensured through regular monitoring by IA. So far, no major impacts apart from earlier identified impacts are anticipated due to such changes in scope. Besides, all other applicable laws/rules/regulations of the country & funding agencies are being complied with and till date no violation/ penalty with respect to contravention of any regulations has been reported. During assessment, it has also been observed that so far, the project has achieved zero fatality with no major noncompliance of EMP/Contract provisions as stipulated in IEAR, which is an indicative of the strict vigil of the IA.

It has also emerged from the survey & PRA exercise that the PAPs were appreciative of the project and hoped that the power scenario would improve after commissioning of the project. Local people also benefited through project related employment that was being generated. Following observations are drawn from the observations through site visits.

- During the construction phase, the implementing agency needs to ensure strict compliance of the contract provisions/EMP by Contractor especially in respect of workers health and safety.
- Along with labours, supervisors, engineers and Staff of Implementing Agency (IA) should also need to follow the health and safety precautions.
- Need of regular induction and training program for labours and engineers at all sites.

- Training for PMU staff regarding monitoring and implantation of EMP as proposed in IEAR. It is suggested to deploy more environmental professionals for effective environmental monitoring and reporting system.
- Good coordination between IA officers and contractors regarding implementation of Health and Safety Plan.
- Health checkup of labours and other working staff are regularly executed and records are maintained. However, the Records of labour registration should be well maintained and strictly monitored.
- Training and awareness regarding cleanliness and solid waste disposal to maintain the hygiene in the labour camps and construction sites.
- The basic needs at workers camp should be provided on site. Transit camps should be well equipped.
- Demarcation and protection for sites where work has been on hold due to various reasons to avoid accidents and runoff of excavated soil from construction sites
- Project staff of the implementing agency should be well versed with the contents of the IEAR so as to ensure proper compliance by the contractors.
- Overall, the commissioning of the project is promised to augment the power distribution and availability in the region which will further catalyze economic activity and development of the area/region.

6. PROJECT IMPLEMENTATION ARRANGEMENT & MONITORING

For smooth implementation of this project, following administrative and functional set up have been institutionalized for project implementation, review and monitoring.

6.1 Administrative Arrangement for Project Implementation

MoP, GoI has appointed POWERGRID as Design cum Implementation Supervision Consultant (i.e., Project Management Consultant-PMC) and now redesignated as Implementing Agency (IA). However, the ownership of the assets with respective State government or State Utilities, which upon progressive commissioning is to be handed over to them for taking care of Operation and Maintenance of assets. The arrangement for monitoring and reviewing of project from the perspective of environment and social management are form part of overall arrangements for project management and implementation environment. Following implementation arrangement has been proposed at different levels for smooth implementation of this project;

Central Project Implementation Unit (CPIU) - A body responsible for coordinating the preparation and implementation of the project and are housed within the IA's offices at Guwahati. The "Project-In-Charge" of IA & Head of each of the SPCU is a member of CPIU.

State Project Coordination Unit (SPCU) – A body formed by the Utility and responsible for coordinating with IA in preparing and implementing the project at the State level. It consists of experts across different areas from the Utility and is headed by an officer of the rank not below Chief Engineer, from the Utility.

Project Implementation Unit (PIU) – A body formed by the IA, including members of Utility on deputation, and responsible for implementing the Project across the State, with its personnel being distributed over work site & working in close association with the SPCU/ CPIU. PIU report to State level "Project Manager" nominated by the Project-in- Charge of IA. The IA is Core team stationed at the CPIU on permanent basis and other IA officers (with required skills) generally visit as and when required by this core team. This team is represented IA and to be responsible for all coordination with SPCU, PIU, within IA and MoP, GoI. CPIU is also assist MoP, GoI in monitoring project progress and in its coordination with The Bank.

6.2 Review of Project Implementation Progress

To enable timely implementation of the project/subprojects, following committee has been setup to review the progress;

Joint Co-ordination Committee (JCC): IA and SPCU nominate their representatives in a body called JCC to review the project. IA was specified quarterly milestones or targets, which is to be reviewed by JCC through a formal monthly review meeting. This meeting forum is called as Joint Co-ordination Committee Meeting (JCCM). The IA is convene & keep a record of every meeting. MoP, GoI and The Bank may join as and when needed. Minutes of the meeting to be shared with all concerned and if required, with GoI and The Bank.

High Power Committee (HPC): The Utility in consultation with its GoT arrange to constitute a High-Power Committee (HPC) consisting of high-level officials from the Utility, State/ District

Administration, Law enforcement agencies, Forest Department etc. so that various permission/ approvals/ consents/ clearances etc. are processed expeditiously so as to reach the benefits of the Project to the end consumers. HPC is meet on bimonthly basis or earlier, as per requirement. This forum to be called as High-Power Committee Meeting (HPCM) and the SPCU keep a record of every meeting. Minutes of the meeting is to be shared with all concerned and if required, with GoI and The Bank.

Contractor's Review Meeting (CRM): Periodic Review Meeting is held by officials of PIU with Contractors at field offices, State Head Quarters (PIU location) and if required with core team of IA at Guwahati. These is to be called "Contractor's Review Meeting" (CRM). PIU is keep a record of all CRMs, which is shared with all concerned and if required, with GoI and The Bank.

A review is regularly held among MoP, GoI, WB, GoT, Utility and IA, at four (4) months interval or earlier if needed, primarily to maintain oversight at the top level and also to debottleneck issues that require intervention at GoI/ State Government level. Minutes of the meeting is generally prepared by IA and shared with all concerned.

6.3 Environmental and Social Monitoring

Monitoring is a continuous process for TSECL projects at all the stages, be it the site selection, construction or maintenance. As Implementing Agency (IA) POWERGRID endeavors to implement the project in close coordination with the respective state power utilities and departments. POWERGRID has been implementing the project based on the Implementation/Participation agreements that were signed separately between POWERGRID and the Power utilities.

The success of TSECL lies in its strong monitoring systems. Apart from the Field In- Charge reviewing the progress on daily basis regular project review meetings are held at least on monthly basis at corporate level wherein apart from construction issues the environmental aspects of the projects are discussed and remedial measures taken wherever required. The exceptions of these meetings are submitted to the Directors and Chairman and Managing Director of the Corporation. The progress of various on- going projects is also informed to the Board of Directors.

TSECL has formed a separate cell at the Circle office level namely Environment and Social Management Cell (ESMC) headed by AGM (Transmission) for proper implementation and monitoring of environmental & social management measures. TSECL organization support structure is depicted in **Figure 6.1**. Key responsibilities of the ESMC are follows:

- Coordinating environmental and social commitments and initiatives with various multilateral agencies, GoT and MoEF&CC.
- Coordination of all environmental activities related to a project from conceptualization to operation and maintenance stage.
- Advising and coordinating /Site office to carry out environmental and social surveys and route alignment for new projects.
- Advising site offices to follow-up with the state forest offices and other state departments for expediting forest clearances and other E & S issues of various projects.
- Providing a focal point for interaction with the MoEF&CC for expediting forest clearances

- Training of Circle and Site officials on E & S issues arising out of T&D projects and their management plan.
- Training of other departments to familiarize them with the ESPP document.

Additionally, Field In-Charge reviews the progress on daily basis and periodic review by higher management including review by Heads of SPCU and CPIU undertaken wherein apart from construction issues the environmental aspects of the projects are discussed and remedial measures taken wherever required. Besides, Periodic Contractor's Review Meeting (CRM) are being held by officials of PIU with Contractors at field offices, State Head Quarters (PIU location) and with CPIU at Guwahati for better coordination and resolution any pending issues. The World Bank mission team also visits various sites every six months to review the progress status including ground level implementation of safeguard measures. Any observation/agreed action plan suggested by the WB in the Aide Memoire is religiously complied in time bound manner. Additionally, review meeting among MOP, GoI, WB, GoT, Utility and IA being held periodically to maintain oversight at the top level and also to debottleneck issues that require intervention at GoI/ GoT level.

The Capacity building and Institutional Strengthening program of the IA is held intermittently to enhance the skills of the project officials. Besides, separate E & S training are also organized for Official of State Utility under Capacity Building & Institutional Strengthening (CBIS) program. Further, State utility meetings between IA and AEGCL/APDCL are held on a monthly/ bi-monthly basis to assess the work progress and difficulties encountered in respect of land acquisition, RoW and compensation if any. The IA has a continuous monitoring mechanism of the project w.r.t. compliance of the mitigation measures as stipulated in the IEAR. Thus, the adherence to the clauses by the contractors are regularly monitored especially in respect of various implementation E & S measures including health and safety aspects. Due to such strong institutional support structure coupled with monitoring mechanism in place, no major non-compliance was observed/reported during the implementation of projects till date. The project has so far had zero fatality which is indicative of the strict vigil of the IA.

During the present study, our team also observed mitigation measures as suggested in IEAR are mostly complied with even though some gaps were found with respect proper to documentation. It has been observed during field visit and interactions with local people, contractors and contract workers that PGCL has adequately taken all precautions and importance to environmental & social aspects. The stakeholders are satisfied with the various measures taken by TSECL its proven fact from the interactions that no complaints are received from the project area. Design realignment, consultation i.e., PAP, Environment & safety awareness training and regular interactions with all the stakeholders has led to sustainability of the project.

As regards monitoring of impacts on ecological resources particularly in Forest, Sanctuary or National Park, it is generally done by the concerned Divisional Forest Officer, Chief Wildlife Warden and their staff as a part of their normal duties. A detailed Environment Management Plan (EMP) including monitoring plan for all possible environmental and social impact and its proper management has been drawn (**Table- 5.5**) and is being implemented during various stage of project execution. Since many provisions of EMP are to be implemented by contractor hence for proper monitoring EMP has included in the contract document. A budget estimate towards tree/crop/tower base compensation and EMP implementation is prepared and is placed at **Annexure-11**. A summary of the same is presented below **Table No.6.1**:

Table 6-1: Summary Budget Estimate

Sr. No.	Budgetary Head	Amount (Rs. akhs)
1	Forest compensation	3140.00
2	Tree & Crop damage Compensation	117.25
3	Land Compensation for Tower Footing	10.20
4	Implementation Monitoring & Audit	18.20
Total		3285.65

Any other measures like provision of bird guards, spike guards, barbed wire fencing or any other arrangement for addressing the issues like bird hit/animal/elephant scratching etc. is finalized only after detailed/ check survey and finalization of route alignment. Since the detailed/ check survey is part of main package requirement of such measures, its extent and estimated cost is incorporated in the revised cost estimate proposal which is normally prepared for all projects as there is a considerable time gap between planning and actual implementation. However, as per the preliminary assessment such additional measures may not be required in the instant scheme as no such impact are envisaged due to routing of lines far away from such sensitive areas.

6.4 Grievance Redressal Mechanism:

Grievance Redressal Mechanism (GRM) is an integral and important mechanism for addressing/resolving the concern and grievances in a transparent and swift manner. In accordance with the provision in ESPPF, Grievance Redress Committees (GRC) has been constituted at the project/scheme level and at Corporate/HQ. This GRC is aimed to provide a trusted way to voice and resolve environment & social concerns of the project, and to address the concerns of the affected person/community in a time bound manner without impacting project implementation.

The Corporate/HQ level GRC has been constituted and notified which is headed by Director (PMU). Similarly, project level GRCs have been constituted for each transmission and S/S covered under this project. Notifications of Corporate & Project level GRC are shown in **Annexure 20**.

Apart from above, grievance redresses in built in crop/tree compensation process where affected persons are given a chance to place their grievances after issuance of notice by revenue officials on the basis of assessment of actual damages. Grievances received towards compensation are generally addressed in open forum and in the presence of many witnesses. Process of spot verification and random checking by the district collector/ its authorized representative also provides forum for raising the grievance towards any irregularity/complain. Moreover, TSECL & POWERGRID officials also address to the complaints of affected farmers and the same are forwarded to revenue official for doing the needful, if required.

Implementation Arrangement for Environment and Social Management by TSECL

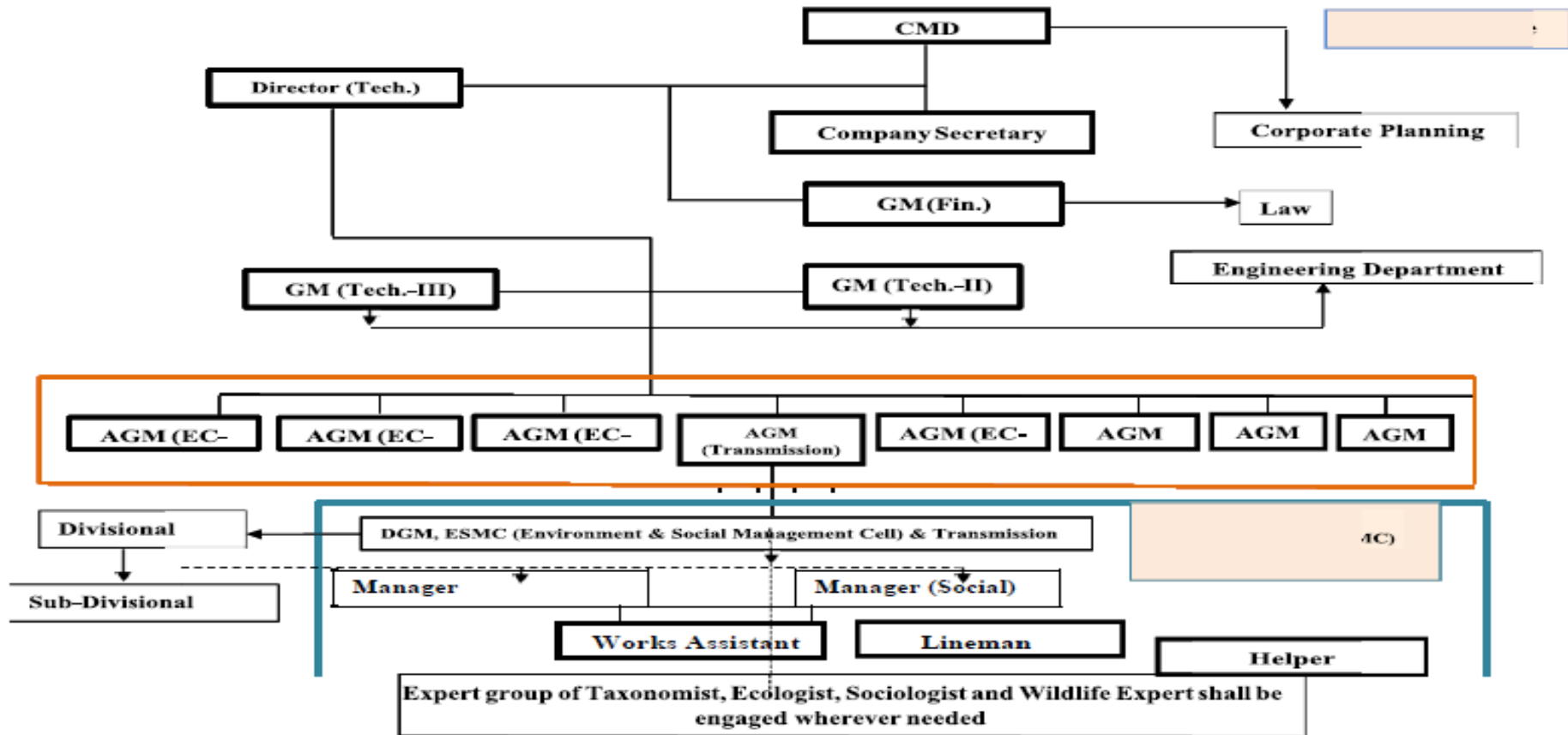


Figure 6-1: Implementation Arrangement for E&S Management by TSECL

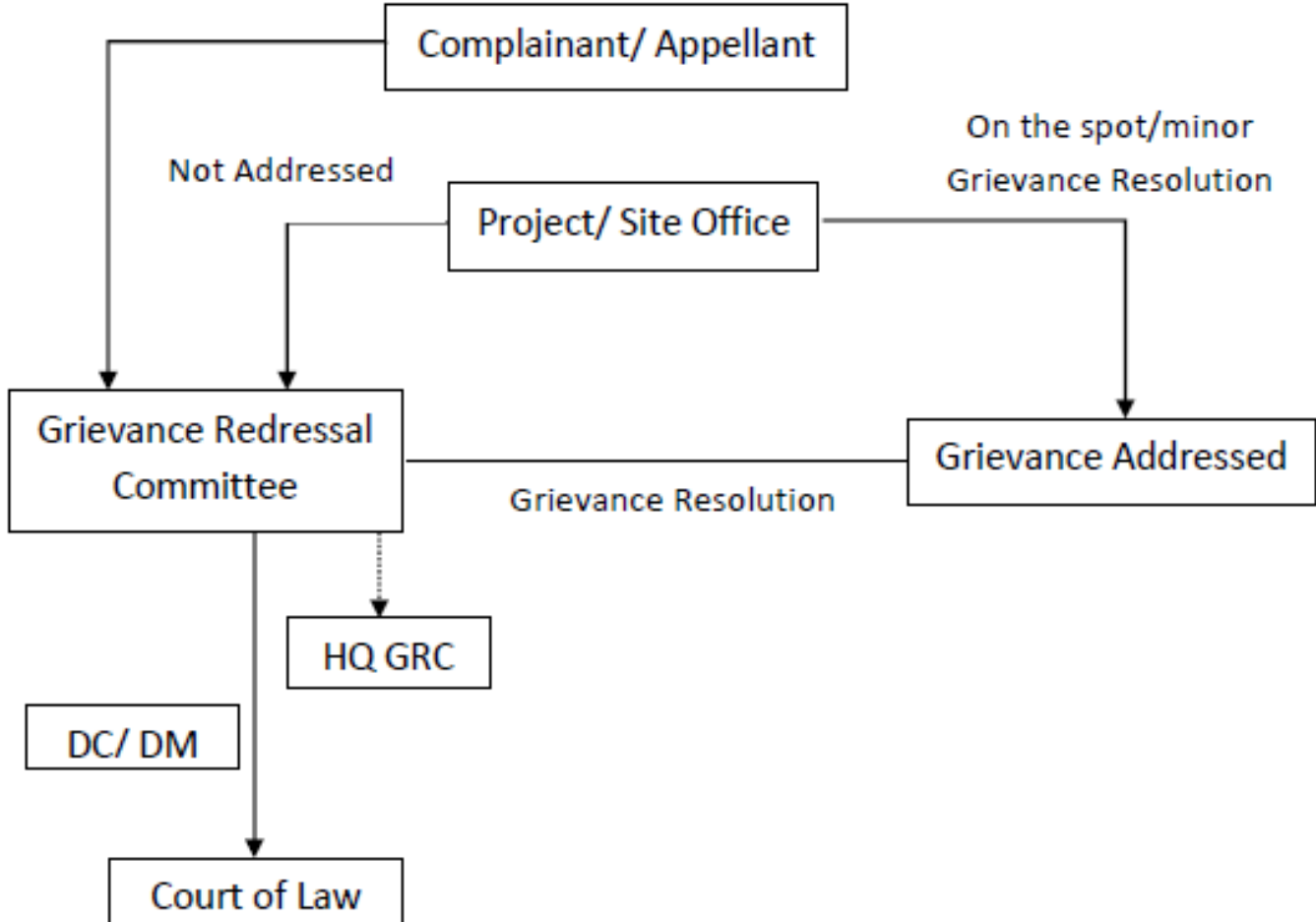


Figure 6-2: Grievance Redressal Mechanism

Site level Grievance Redressal Committee (GRC) has already been constituted. The nominated officials from TSECL and POWERGRID for GRC and **details are annexed in Annexure 20**. Nominees from local administration, panchayat/ADC & affected persons are also mandatory for GRC. Letter has already been issued twice to AGM (Transmission), TSECL for his early action in this regard (**copy of letters enclosed in Annexure 20**).

It has been observed that concerns of public are addressed regularly through public consultation process which started from project planning to construction and will be continued in operation and maintenance also. As per record available, no written complaint or court case is registered till study period against any of the sub projects in instant case. However, we have been informed that only some minor complaints of verbal nature were received by site officials which were also resolved instantly and amicably by site Officials after discussion & deliberation with affected person in consultation of revenue/district officials.

6.5 Good practices of project:

- **All the precautions were taken for health and safety of workers**

At all the other places the contractor has taken all the necessary precautions for prevention of diseases at the project sites. Workers were provided with all the safety equipment, special measures taken for prevention of Covid-19.

- **All the stakeholders were considered for consultation during the project cycle**

All the stakeholders were consulted by POWERGRID and their queries were resolved during formal/informal meetings. Therefore, no any major issue observed during project construction. Because of strong PAP consultation, no any written complaint/court case has been received so far.

- **Eco sensitive zones avoided as far as possible**

Eco sensitive zones avoided totally. River / water ecosystem was not harmed because of pile foundation. Due care is taken to avoid pollution of water resources because of pile foundation work.

- **Avoidance of habituated areas**

Habituated areas were avoided as far as possible to lay towers of 132 kV line. The residential houses are far from the RoW of 132 kV towers, therefore, there is no chance of damage to the human being because of 132 kV line.

- **Interference with utilities**

Wherever utilities were crossed, necessary permissions/NoC was taken from the concern authorities to lay electric wires from their premises. During construction, the concern officials were taking care of avoiding damage to the utility instruments & premises

7. REFERENCES

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3. Guidelines for payment of compensation towards damages in regard to Right of Way for TLs, No.3/7/2015-Trans Government of India Ministry of Power
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15. Anonymous. 2002a. Biodiversity Characterization at Landscape level in North-East India using Satellite Remote Sensing and Geographical Information System. Indian Institute of Remote Sensing, Dehradun.
16. Population Data: Office of the Registrar General & Census Commissioner, India Ministry of Home Affairs, Government of India

Annexure



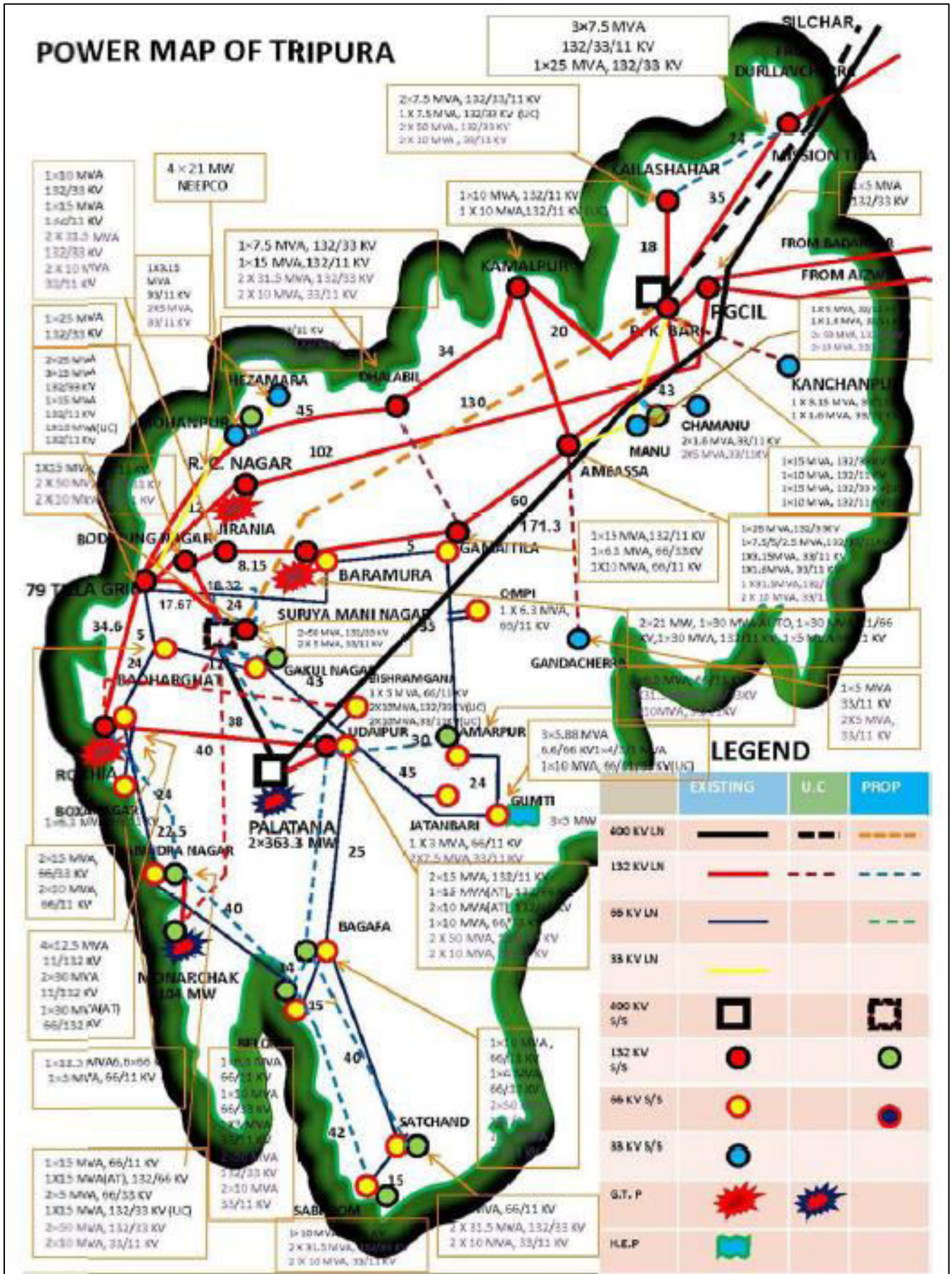
पावरग्रिड
POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



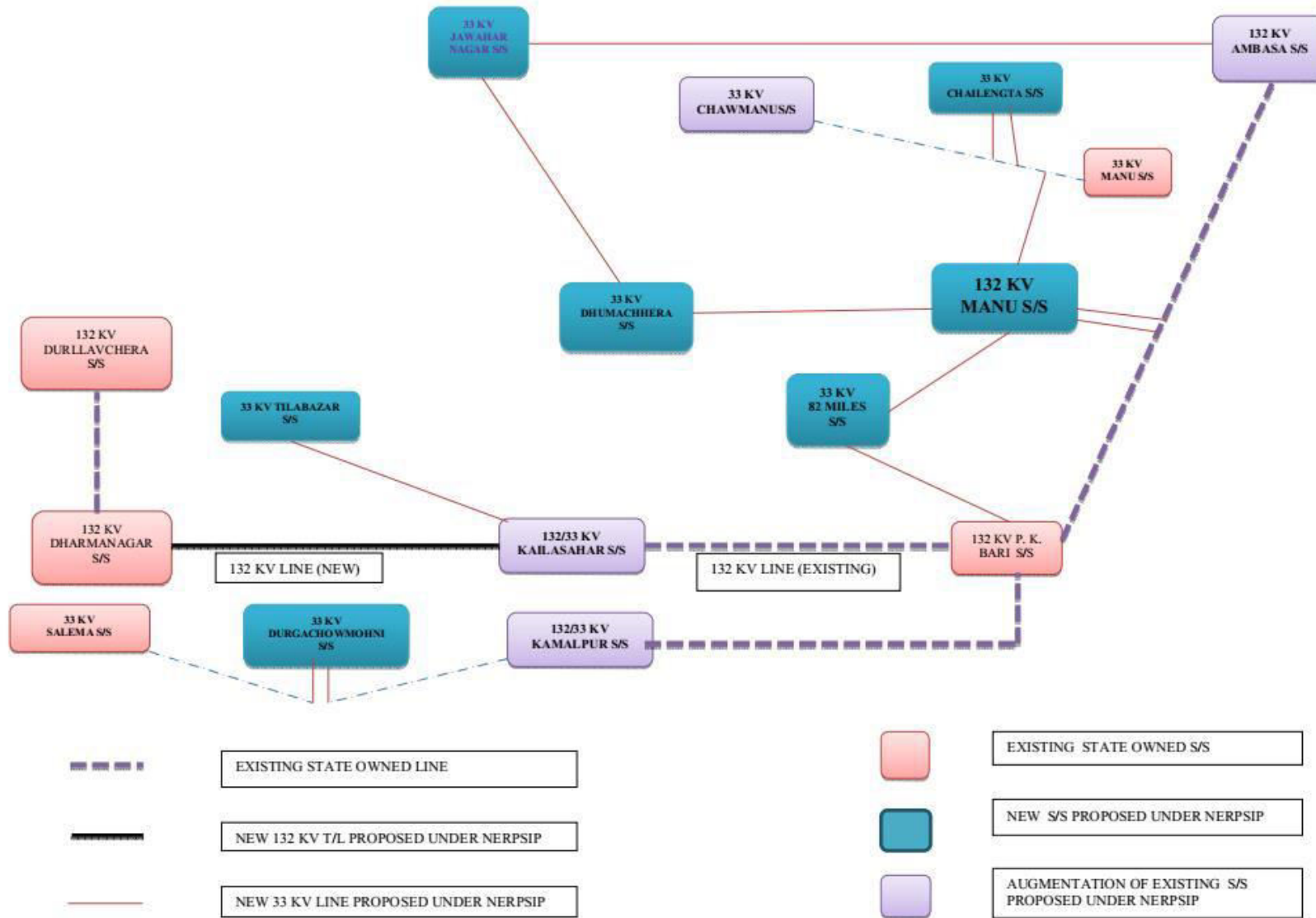
Annexure 1

Power Map of Tripura State



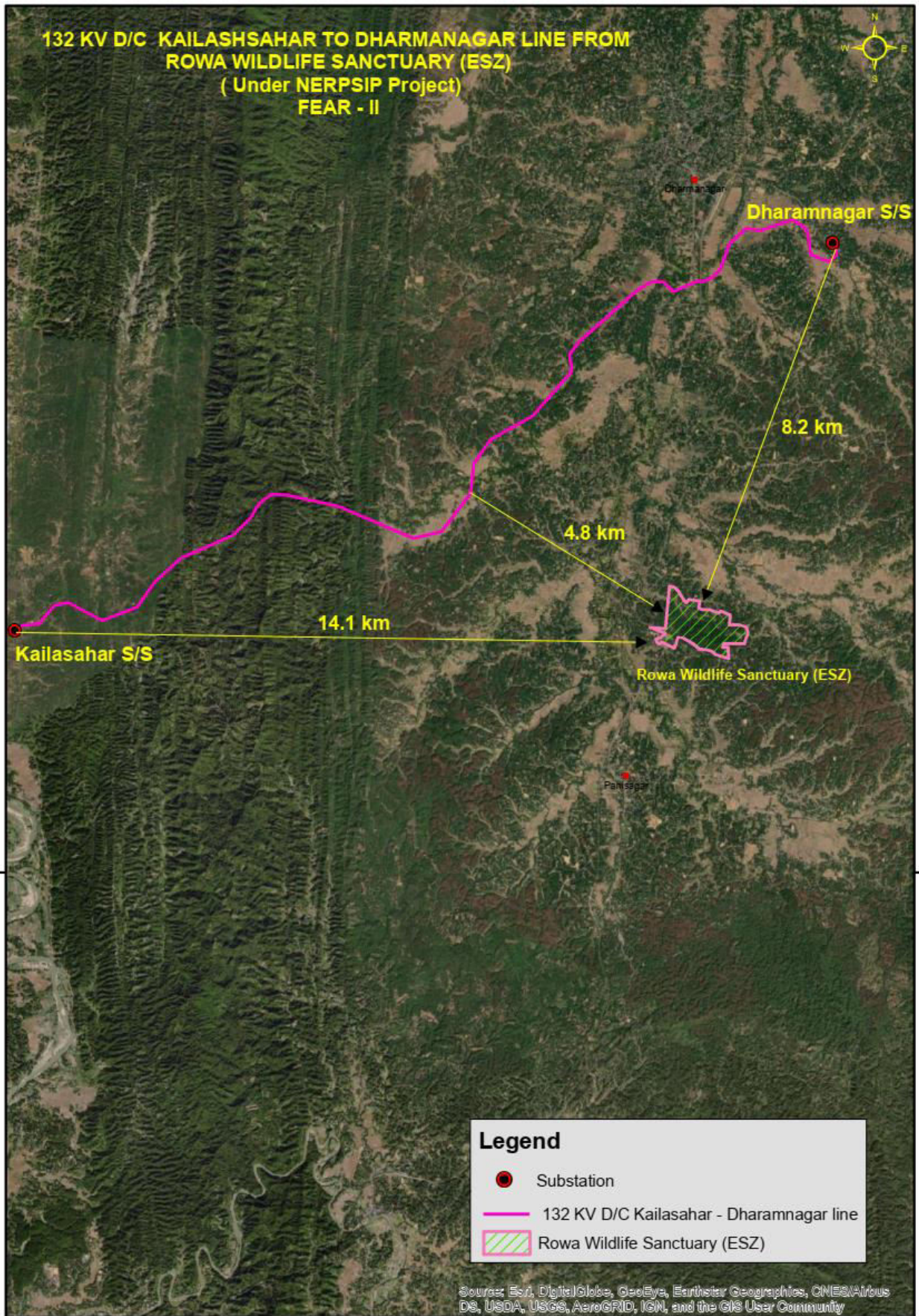
Annexure 2

Schematic map showing the various projects covered under FEAR II



Annexure 3

Distance of 132 kV Kailasahar- Dharmanagar D/C TL from Rowa WLS





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POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



Annexure 4

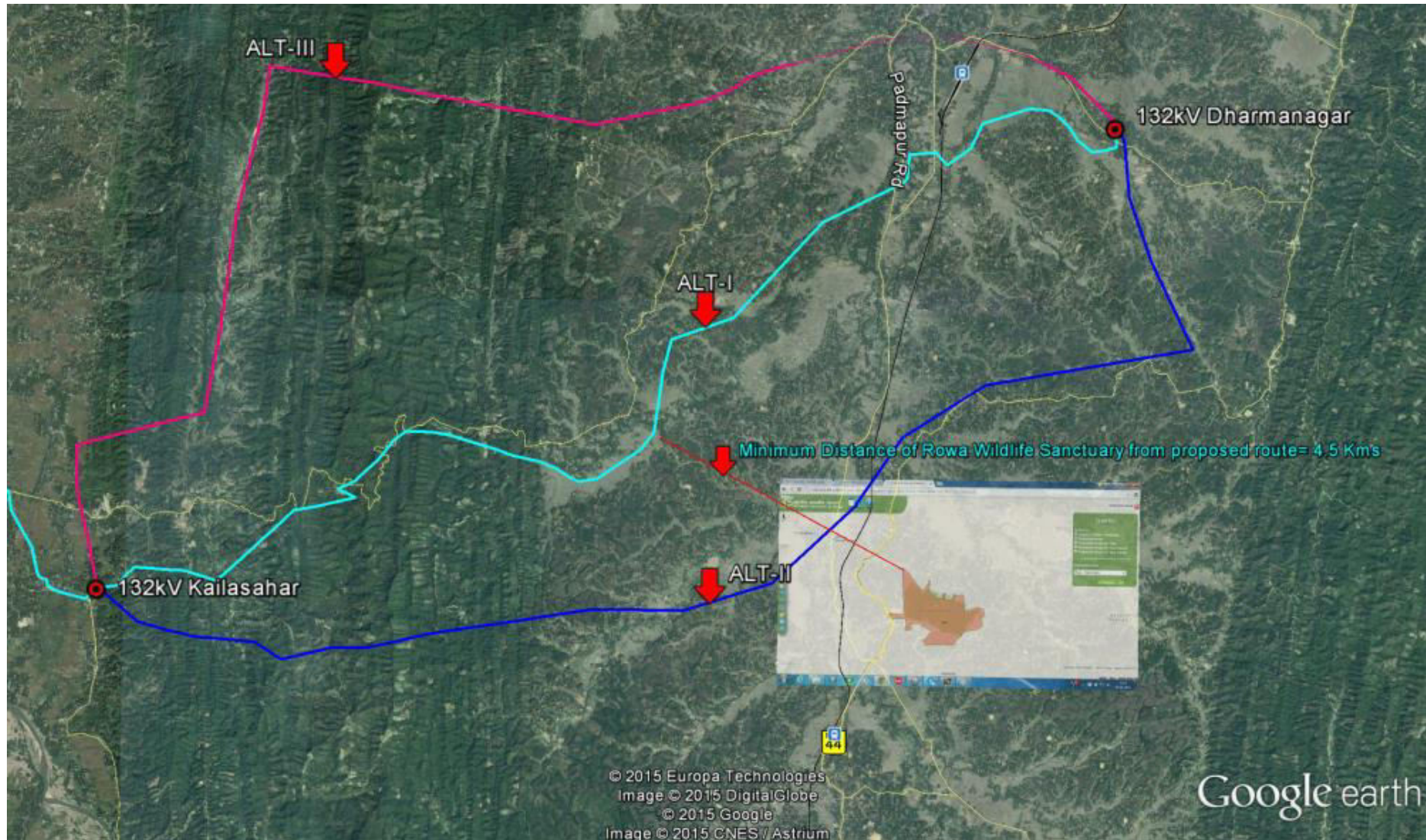


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POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



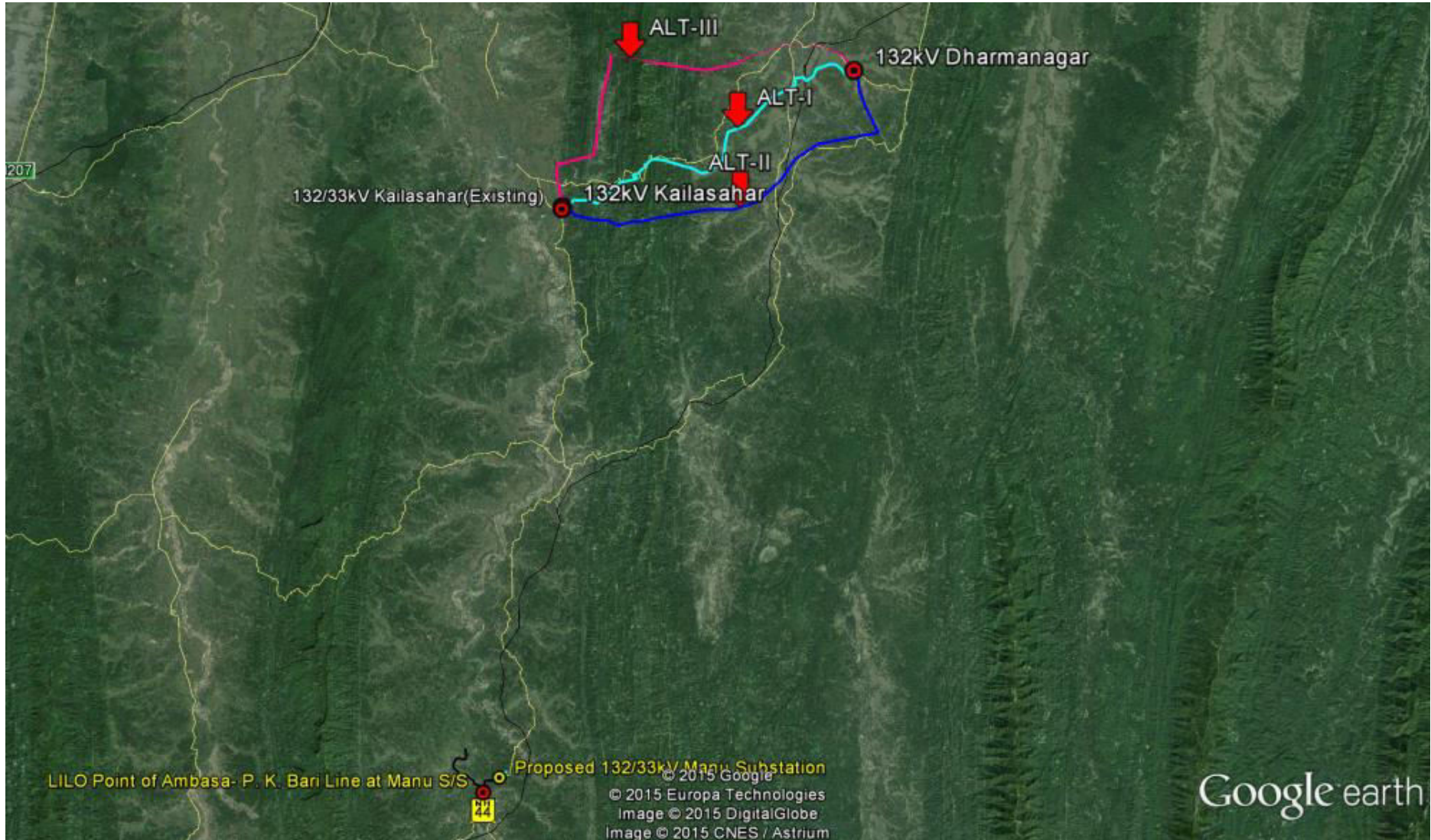
Kailasahar - Dharmanagar 132/33 kV TL - Alternative Alignment Study



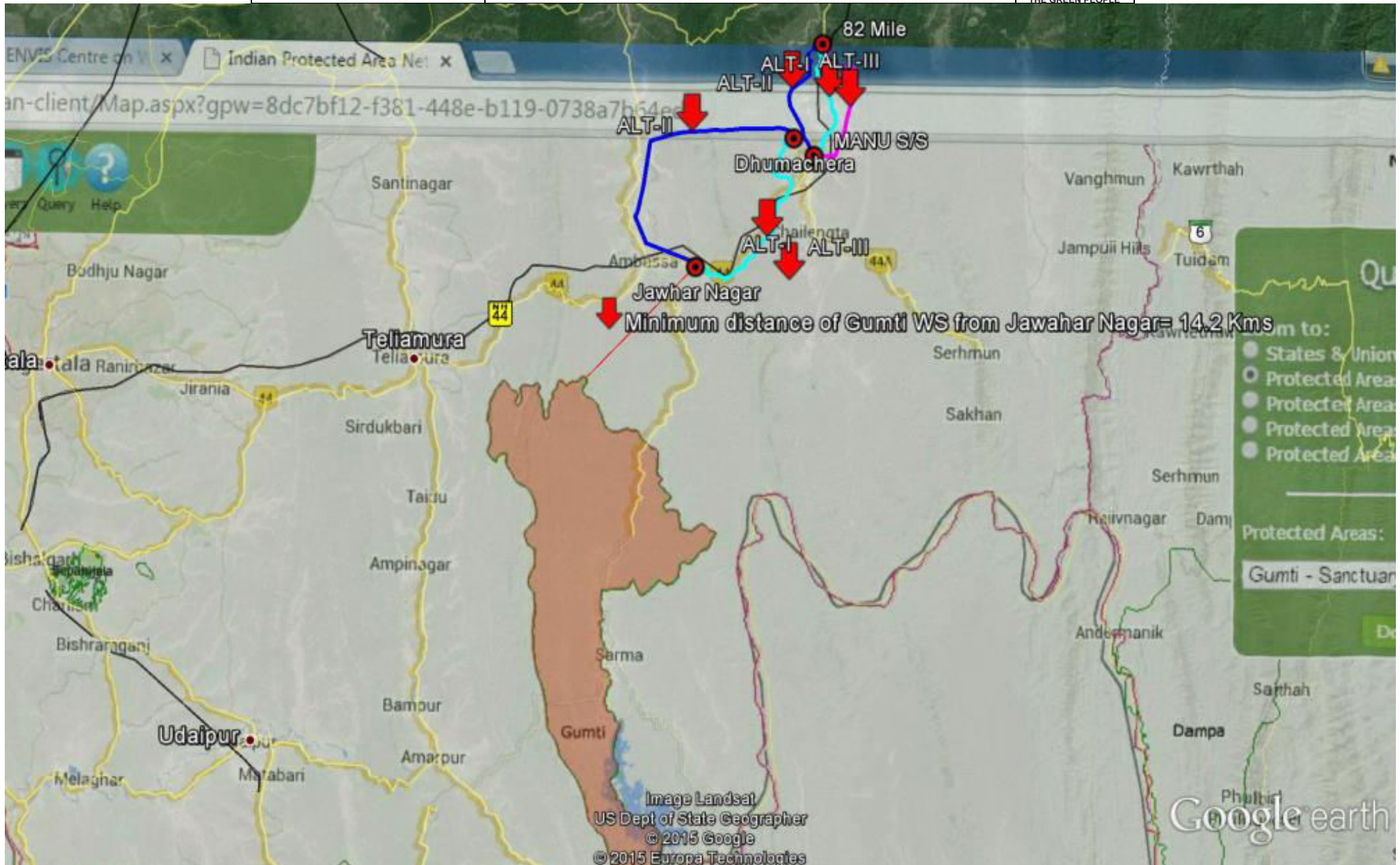


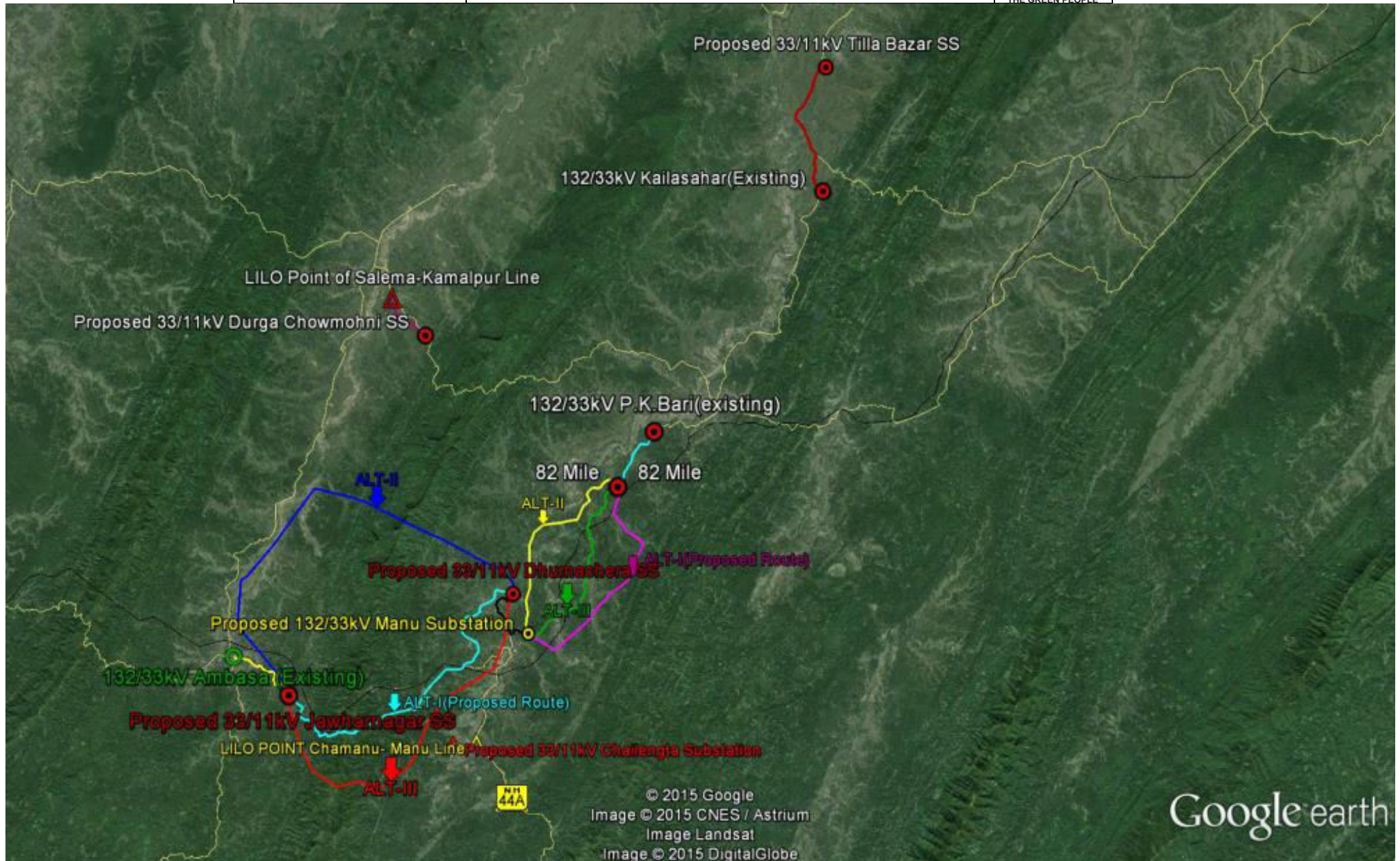
पावरग्रिड
POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



Dhumachhera-Jawahar Nagar 33 kV DL from Gumti WLS – Alternative Alignment Analysis






Annexure 5

Forest Clearances

1. 132/33 kV Kailasahar Dharmanagar TL

 <p>सत्यमेव जयते</p>	<p>Government of India Ministry of Environment, Forest & Climate Change, North Eastern Regional Office, Law-U-Sib Lumbatnngen, Near MTC Workshop, Shillong-793021, टेली/Tel(0364)-253-7609,7340/7395/7278,</p>	<p>भारत सरकार पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय पूर्वांचल क्षेत्रीय कार्यालय, शिलांग लॉड सीब लुम्बतंगेन एम् टी सी के पास, शिलांग -७९३०२१ क्स/Fax -0364- 2536041/2536983</p>
	<p>ईमेल/Email-ro.nez.shil@gmail.com/moefshil_09@rediffmail.com</p>	
<p>No. 3-TR C 037/2017-SHI (620-2)</p>		<p>7th June, 2019</p>
<p>सेवा मे,</p>		
<p>सचिव / Secretary, त्रिपुरा की सरकार / Government of Tripura, पर्यावरण और वन विभाग / Environment and Forest Department, अगरतला / Agartala.</p>		
<p>Sub : Proposal for diversion of 14.3586 ha of forest land for construction of 132 KV D/C Transmission Line from Kailashahar (8.8452 ha) t Dharmanagar (5.5134 ha) under District Forest Officer, Unakoti and North by Tripura State Electricity Corporation Limited.</p>		
<p>Sir,</p>		
<p>This has got reference to the State Government's letter No. F.6-1092/FC/For-2015/101-06 dated 21.06.2017 and No. F.6-1092/FC/For-2015/38492 dated 12.03.2018 on the subject mentioned above, seeking prior approval of the Central Government in accordance with Section 2 of the FCA, 1980. After careful consideration of the proposal of the State Govt of Tripura, In-principle approval was granted vide this office letter of even number dated 10.04.2018 subject to fulfillment of certain conditions. The State Government has furnished compliance report in respect of the conditions stipulated in the in-principle approval and has requested the Central Government to grant final approval.</p>		
<p>In this connection and on the basis of the compliance report furnished by the State Government vide letter No.F.6-1092/FC/For-2015/Pt-I/137-39 dated 16.05.2019 and confirmation of funds transferred and payment made in web portal, Final Approval of the Central Government is hereby granted under Section-2 of the Forest (Conservation) Act, 1980 for diversion 14.3586 ha of forest land for construction of 132 KV D/C Transmission Line from Kailashahar (8.8452 ha) Dharmanagar (5.5134 ha) under District Forest Officer, Unakoti and North by Tripura State Electricity Corporation Limited, subject to the following conditions:</p>		
<p>(1) The legal status of the forest land shall remain unchanged.</p>		
<p>(2) Compensatory afforestation (CA) shall be carried out over double the area diverted i.e. 28.99 ha in degraded forest area identified in Balidhum & Samrupar Mouja, Panisagar & Kailashahar Range, Dharmanagar & Kailashahar Forest Sub Division of North & Unakoti District of Tripura as per the fund deposited by the User Agency & scheme furnished by the State Govt. The species planted should be indigenous and Medicinal Plants / Shrubs / Herbs (about 20%).</p>		
<p>(3) The demarcation of forest land proposed for diversion shall be done on the ground at project cost using four feet high reinforced cement concrete pillars with serial numbers, forward and backward bearings and distance from pillar to pillar superscribed on the pillars.</p>		

- (4) The User Agency shall restrict the felling of trees to minimum number in the diverted forest land and the trees shall be felled only when it is unavoidable under strict supervision of the State Forest Department.
- (5) The plantation of dwarf species in right of way under the transmission lines wherever feasible should be carried out under project cost in consultation with State Forest Department.
- (6) The User Agency at its cost shall provide bird deflectors, which are to be fixed on upper conductor of transmission line at suitable intervals to avoid bird hits.
- (7) The User Agency shall comply with the guidelines for laying transmission through forest areas issued by Ministry vide letter no. 7-25/2012-FC dated 05/05/2014 & 19/11/2014.
- (8) No labour camps shall be established on the forest land.
- (9) Sufficient firewood, preferably the alternative fuel, shall be provided by the User Agency to the labourer after purchasing the same from the State Forest Department or the Forest Development Corporation or any other legal source of alternative fuel.
- (10) No additional or new path will be constructed inside the forest area for transportation of construction materials for execution of the project work.
- (11) The period of diversion under this approval shall be co-terminus with the period of lease to be granted in favour of the user agency or the project life, whichever is less.
- (12) The User Agency shall obtain the Environmental Clearance under Environment (Protection) Act, 1986, if applicable.
- (13) The User Agency will have to obtain the Forest (Conservation) Act, 1980 clearance for removal of stone, river sand, river boulders in forest land, if necessary.
- (14) All other clearances / NOCs under different rules / regulations / local laws and under Forest Dwellers (Recognition of Forest Rights) Act, 2006 as required vide MoEF, New Delhi guideline No. 11-9/98-FC(Pt) dated 05.02.2013 shall be complied with.
- (15) The lay out of the proposal shall not be changed without the prior approval of the Central Government.
- (16) The forest land shall not be used for any purpose other than that specified in the project proposal.
- (17) The User Agency and the State Government shall ensure compliance of all the Court orders, provisions, rules, regulations and guidelines for the time being in force as applicable to the project.
- (18) The forest land proposed to be diverted shall under no circumstances be transferred to any other agencies, department or person without prior approval of Govt. of India.
- (19) Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as per the MoEF & CC Guidelines F No. 11-42/2017-FC dated 29/01/2018.
- (20) Any other conditions that the North Eastern Regional Office, Ministry of Environment, Forest & Climate Change may stipulate from time to time in the interest of conservation, protection and development of forests & wildlife.

This is issued with the approval of Addl. Director General (Central).

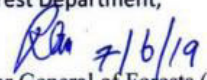
भवदीय


(आर. एल. सांगा)/(R.L. Sanga)

उप वन महानिरीक्षक (केंद्रीय)/ Deputy Inspector General of Forests (C)

Copy to:

1. प्रधान मुख्य संरक्षक एफ वन और होफ / The Principal Chief Conservator of Forests & HoFF
त्रिपुरा की सरकार / Government of Tripura, पर्यावरण और वन विभाग / Environment and Forest Department,
अगरतला / Agartala.

 7/6/19
उप वन महानिरीक्षक (केंद्रीय)/ Deputy Inspector General of Forests (C)

2. 132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line

GOVERNMENT OF TRIPURA
FOREST DEPARTMENT

No.F. 6-1251/FC/For-2020/ 52800-807

Dated, the 02nd March, 2021

ORDER

Sub: - Proposal for diversion of 0.99728 ha of forest land for construction of 33 KV overhead line from Ambassa to Jawaharnagar in favour of TSECL under District Forest Officer, Dhalai

After careful consideration of the proposal of Addl. General Manager & Nodal Officer, Transmission Circle, TSECL, Agartala conveys the approval in Principle in accordance with Section-2(ii) of Forest (Conservation) Act, 1980 for diversion of forest land measuring 0.99728 ha of forest land for construction of 33 KV overhead line from Ambassa to Jawaharnagar of mouja-Bagmara/Kathalbari for construction of 33 KV overhead line from Ambassa to Jawaharnagar under District Forest Officer, Dhalai subject to the following conditions:-

1. The Legal status of the forest land shall remain unchanged.
2. The compensatory afforestation shall be taken up by the Forest Department over double the degraded forest area of 2.00 ha in degraded forest land in Mouja-Sardingkhapara, CS Plot No.34, Kh. No.3/6 under Gumti Wildlife Sanctuary at the cost of user agency. As far as possible, mixture of local indigenous species shall be planted and monoculture of any species may be avoided.
3. The State Govt shall charge the Net Present Value for the forest area to be diverted under the proposal from the User Agency as per the Judgment of the Hon'ble Supreme Court of India dated 30.10.2002, 01.08.2003, 28.03.2008, 24.04.2008 & 09.05.2008 in IA No.566 in WP (C) No.202/1995 and as per the guideline issued by this Ministry vide letter No. 5-2/2006-FC dated 03.10.2006 No. 5-3/2007-FC dated 05.02.2009. The requisite funds shall be transferred through online portal to Ad-hoc CAMPA account of the State concerned.
4. The cost of the compensatory afforestation at the present prevailing wages as per the compensatory afforestation shall be deposited in the compensatory afforestation fund of Tripura State manage by the Adhoc CAMPA through e-portal in the account of the Ad-hoc CAMPA. The CA will be maintained for 10 years. The scheme may include appropriate provisions for anticipated cost increase for works scheduled for subsequent years.
5. Additional amount of NPV of the diverted forest land, if any, becoming due after finalization of the same by the Hon'ble Supreme Court of India on receipt of the report from the Expert Committee, shall be charged by the State Govt. from the User Agency. The user agency shall furnish an undertaking to this effect.
6. All the funds received from the User Agency under the project towards compensatory levies shall be transferred/ deposited to Compensatory Afforestation Fund of Tripura State managed by the Ad-hoc CAMPA only through e-portal mode.
7. The User Agency shall bear and deposit the amount of the cost of demarcation of the land proposed for diversion directly to the concerned District Forest Officer. The concerned District Forest Officer shall demarcate the land proposed for diversion on the ground by erecting at least four feet high cement-concrete pillars duly numbered, forward and backward bearing and distance from pillar to pillar written on the pillars and DGPS co-ordinates to be inscribed on the pillars. The competent authority shall verify and issue a certificate to this effect. Photographs showing boundary pillars with GPS co-ordinates are to be submitted.
8. The charges for felling, logging and transportation of project affected trees should be collected from the User Agency at the rates approved by the State Govt and deposited with the DFO concerned for utilization immediately following the diversion of forest land.

Contd.P.2

P.2

9. The expenditure like felling, logging and transportation of project affected trees should be collected from the user agency at the rates approved by the State Govt. and deposited with the DFO concerned for utilization immediately following the diversion of the forest land.
10. The expenditure like boundary walls, stone pillars, and demarcation charges cost of damage of trees the fund on these accounts should be deposited with DFO concerned.
11. The user agency shall restrict the felling of trees to minimum number in the diverted forest land and trees shall be felled under strict supervision of State Forest Department Forest and the cost of the felling of trees shall be deposited by the user agency with the State Forest Department.
12. The complete compliance to the Forest Right Act, 2006 shall be ensured by way of prescribed certificate from the concerned District collector.
13. The user agency at its cost shall provide bird deflectors, which are to be fixed on upper conductor of transmission line at suitable intervals to avoid bird hits.
14. The user agency shall comply with the guidelines for laying transmission line through forest areas issued by Ministry vide letter No.7-25/2012-FC dated 05.05.2014 & 19.11.2014.
15. The user agency shall obtain Environment Clearance as per the project provisions of the Environment (Protection) Act, 1986, if required under the said Act.
16. The lay out plan of the proposal shall not be changed without the prior approval of the Central Government.
17. No labour camp shall be established on the forest land.
18. Sufficient quantity of firewood, preferably the alternate fuel, shall be provided by the user agency to the labourers after purchasing the same from the State Forest Department or the Forest Development Corporation or any legal source of alternate fuel.
19. No additional or new path will be constructed inside the forest area for transportation of construction materials for execution of the project work.
20. The forest land proposed to be diverted shall not be used for a purpose other than that specified in the proposal and under no circumstance be transferred to any other agency, department or person without prior approval of Govt. of India.
21. The User Agency will have to obtain the Forest (Conservation) Act, 1980 clearance for stone, riversand, riverboulders in forest land, if necessary.
22. As per Ministry's letter No.11-30/96-PC (pt) dt. 14.09.2001, if the compliance of stipulated conditions is awaited for more than 5 years, the in-principle approval would summarily be revoked considering that the user agency is no longer interested in the project.
23. Violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as per the MoEF & CC guideline F.No.11-42/2017-FC dt. 29/01/2018.
24. All other clearance/ NOCs under different applicable rules/ regulations / local laws under Forest Dwellers (Recognition of Forest Rights) Act, 2006 required vide MoEF, New Delhi guideline No.11-9/1998-FC(pt) dated 03.08.2009 shall be complied with.
25. Any other conditions that the North Eastern Regional Office, Ministry of Environment, Forest & Climate Change may stipulate from time to time in the interest of conservation, protection and development of forests & Wildlife.
26. The compliance report shall be uploaded on *e-portal* (<https://parivesh.nic.in>).
27. The Govt. shall consider granting final approval for the project after getting the compliance report against the stipulation mentioned above from the user agency.

Contd.P.3



P.3

This is in pursuance to the general approval under Section-2(ii) of Forest (Conservation) Act, 1980 and Forest (Conservation) Rules, 2003(Guidelines & Clarifications) Handbook 2019- Critical/ Strategic Defence Infrastructure.

(Harshakumar C)
Joint Secretary
to the Government of Tripura

Copy to:-

1. The Principal Chief Conservator of Forests & HoFF, Tripura.
2. The Deputy Director General of Forests (Central), Ministry of Environment & Forests North Eastern Regional Office, Law-U-Sib, Lumbatngen, Near M.T.C. Workshop, Shillong 793021.
3. The Nodal Officer, FCA, O/O- the Principal Chief Conservator of Forests, Tripura
4. The District Magistrate & Collector, Dhalai District, Ambassa
5. The District Forest Officer, Dhalai District, Ambassa
6. The Sub-Divisional Magistrate, Gandacherra
7. The Wildlife Warden, Gandacherra
8. The Addl. General Manager, Transmission Circle, TSECL, 79 Tilla, Agartala

Joint Secretary
to the Government of Tripura



पावरग्रिड
POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



Annexure 6

MoP Guidelines Dated 5th OCT.'15 for Payment of Compensation for Transmission Line

No.3/7/2015-Trans
Government of India
Ministry of Power
Shram Shakti Bhawan
Rafi Marg, New Delhi – 110001

Dated, 15th October, 2015

To

1. Chief Secretaries/Administrators of all the States/UTs
(As per list attached)
2. Chairperson, CEA, New Delhi with the request to disseminate the above guidelines to all the stakeholders.
3. CMD, PGCIL, Gurgaon.
4. CEO, POSOCO, New Delhi.
5. Secretary, CERC, New Delhi.
6. CMD of State Power Utilities/SEBs.

Subject: Guidelines for payment of compensation towards damages in regard to Right of Way for transmission lines.

During the Power Ministers Conference held on April 9-10, 2015 at Guwahati with States/UTs, it has, *inter alia*, been decided to constitute a Committee under the chairmanship of Special Secretary, Ministry of Power to analyse the issues related to Right of Way for laying of transmission lines in the country and to suggest a uniform methodology for payment of compensation on this count. Subsequently, this Ministry had constituted a Committee with representatives from various State Governments and others. The Committee held several meetings to obtain the views of State Governments on the issue and submitted its Report along with the recommendations (copy of the Report is at Annex-1).

2. The Recommendations made by the Committee are hereby formulated in the form of following guidelines for determining the compensation towards "damages" as stipulated in section 67 and 68 of the Electricity Act, 2003 read with Section 10 and 16 of Indian Telegraph Act, 1885 which will be in addition to the compensation towards normal crop and tree damages. This amount will be payable only for transmission lines supported by a tower base of 66 KV and above, and not for sub-transmission and distribution lines below 66 KV:-

- (i) Compensation @ 85% of land value as determined by District Magistrate or any other authority based on Circle rate/ Guideline value/ Stamp Act rates for tower base area (between four legs) impacted severely due to installation of tower/pylon structure;

—/—

- (ii) Compensation towards diminution of land value in the width of Right of Way (RoW) Corridor due to laying of transmission line and imposing certain restriction would be decided by the States as per categorization/type of land in different places of States, subject to a maximum of 15% of land value as determined based on Circle rate/ Guideline value/ Stamp Act rates;
- (iii) In areas where land owner/owners have been offered/ accepted alternate mode of compensation by concerned corporation/ Municipality under Transfer Development Rights (TDR) policy of State, the licensee /Utility shall deposit compensation amount as per (i) & (ii) above with the concerned Corporation/ Municipality/ Local Body or the State Government.
- (iv) For this purpose, the width of RoW corridor shall not be more than that prescribed in the table at Annex-2 and shall not be less than the width directly below the conductors.
3. Necessary action may kindly be taken accordingly. These guidelines may not only facilitate an early resolution of RoW issues and also facilitate completion of the vital transmission lines through active support of State/ UT administration.
4. All the States/UTs etc are requested to take suitable decision regarding adoption of the guidelines considering that acquisition of land is a State subject.

Yours faithfully,


(Jyoti Arora)

Joint Secretary (Trans.)
Tele: 011-2371 0389

Copy, along with enclosure, forwarded to the following:

1. Secretaries of Government of India (Infrastructure Ministries/Deptt including MoEF - As per attached list)
2. Prime Minister's Office (Kind Attn: Shri Nripendra Mishra, Principal Secretary to PM)
3. Technical Director, NIC, Ministry of Power with the request to host on the website of Ministry of Power.

Copy to PS to Hon'ble MoSP (IC) / Secretary (Power) / AS (BNS) / AS (BPP) / All Joint Secretaries/EA/ All Directors/DSS, Ministry of Power.

Annexure 7

The letter was issued to TSECL regarding adoption of MoP, GoI Guidelines for payment of compensation towards damages in regards to RoW for Transmission lines vide ref. *NEAGT/NERPSIP-102/2017-18/212* dated *15/05/2018*.



पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)

**POWER GRID CORPORATION
OF INDIA LIMITED**

(A Government of India Enterprise)



पावरग्रिड

दूरभाष : (0381)2330045 (क)

NERPSIP Office,

Ramnagar-06(Middle), 3rd Crossing, Agartala - 799002.

उत्तर पूर्वी क्षेत्र / NORTH EASTERN REGION

Date: 15/05/2018

Ref. : NEAGT/NERPSIP-102/2017-18/312

To,

The AGM(Transmission Circle)
Tripura State Electricity Corporation Limited
79 Tilla ; Transmission Circle
Agartala; Tripura(W)

Sub: Adoption of MoP, Govt guidelines for payment and compensation towards damage in regards to RoW for Transmission line for State Government-Reg.

Dear Sir,

With reference to the above subject this is to inform you that Ministry of Power (MOP), Government of India (GOI) has issued "Guidelines for payment of compensation towards damages in regards to Right of Way for Transmission Lines" on 15th October 2015. In the said letter MoP requested all the states/UTs etc to take suitable decision regarding adoption of the guidelines considering that compensation towards diminution of land value in the width of Right of Way is a state subject.

As per the guidelines, Govt of Assam & Manipur has already implemented the guideline in their respective states. The notification issued by Govt of Assam & Govt of Manipur is enclosed herewith for your ready reference. The guidelines of MoP, GOI and Notification of Govt of Assam was also earlier forwarded to M/s TSECL vide our letter ref NEAGT/NERPSIP-102/2017-18/465 dtd 06/06/2017.

In view of above, since we have already started construction activity of 132kV Transmission lines under NERPSIP Tripura Project you are hereby requested to kindly take up the matter with state government for issuing guidelines for payment of compensation towards the damage in regards to RoW for Transmission Lines.

Thanking you.



Yours faithfully

(S.I. Singh)

Dy. General Manager
POWERGRID; Agartala.

Copy for kind information to:-

- 1. CMD TSECL, Corporate Office, Banamalipur, Agartala.

Registered Office: B-9 Qutab Institute Area, Katwaria Sarai, New Delhi- 110016

Tel: 011-26560112, Fax: 26601081, Website: <http://www.powergridindia.com>

संविन एव च राष्ट्रविन मे जज्ञी वचनम्

Save Energy for Benefit of Self and Nation



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POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



Annexure 8

TSECL intimated POWERGRID that Govt. of Tripura has decided for continuing with the prevailing practice of payment of compensation towards damage in regards to RoW for Transmission lines.



पावरग्रिड
POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and
North Tripura District under NERPSIP in Tripura



TRIPURA STATE ELECTRICITY CORPORATION LIMITED

(A Govt. of Tripura Enterprise)



No. F. 5(85) / TSECL / 2018 - 19 / 1631

Dated, Agartala, the 25th September, 2018

To
The DGM (NERPSIP),
PGCIL,
Ramnagar - 06, 3rd crossing,
Agartala - 799002.

Sub : Adoption of MoP, Gol guidelines for payment of compensation towards damage in
regards to RoW for Transmission lines. - reg.

- Ref: 1) NEAGT / NERPSIP-102 / 2017-18 / 212, dated 15.05.2018.
2) Minutes of Meeting of 4th Project Steering Committee of MoP, Gol vide No. 3 / 16 / 2013 -
Trans. Pt - 3, dated 11th June, 2018.
3) F.1(2) / DT / TSECL / 2018 / 24194, dated, 07.09.2018.

Sir


Kindly refer to Minutes of Meeting of the 4th Project Steering Committee of Ministry of Power, Govt. of
India held on 18th May 2018 at Guwahati on NER Power System Improvement Project (NERPSIP),
where it had been recorded that all States are to confirm their stand on the issue of payment of land
compensation for the tower footing and line corridors to MoP.

In view of the above, please find enclosed herewith the letter of Tripura State Electricity Corporation
Ltd. (TSECL) in the above context for favour of your kind record please.

Thanking you

Encl : As Stated.

Yours faithfully


Adl. General Manager
Transmission Circle, TSECL, Agartala.
25/09/18

OFFICE OF THE ADDITIONAL GENERAL MANAGER, TRANSMISSION CIRCLE, 79 TILLA, AGARTALA
PHONE & FAX: 0381-235-1579



TRIPURA STATE ELECTRICITY CORPORATION LIMITED

(A Govt. of Tripura Enterprise)



No. F. 1 (2) / DT / T. ECL / 2015 / 24194

Dated, Agartala, the 7-September, 2015

To
The Joint Secretary (Trans),
Ministry of Power,
Govt. of India,
Rafi Marg, Shram Shakti Bhawan, New Delhi 110001.

Sub: - Adoption of MoP, Gol guidelines for payment of compensation towards damage in regards to RoW for Transmission lines. - reg.

Sir,

This is to inform you that Govt. of Tripura has decided for continuing with the prevailing practice of payment of compensation towards damage in regards to RoW for Transmission lines as mentioned here-under :

- i) 100 % land value is compensated for tower base affected area as per rate assessed by the District Administration of State Govt. Apart from this if there be any damage to tree/crops/structure in the said area, compensation to the occupier / land owner for the damage in the tower base area is also paid as per State Govt. approved rates. In areas where Land owner does not allow to erect towers, the required land is acquired through acquisition process / purchased through Land Purchase Committee as per norms of State Govt.
- ii) If there be any damage to tree/crops/ structure in the Corridor of width of Right of Way between the towers, compensation for the same is paid to the owner as per rate approved by the State Govt.
- iii) No compensation is paid for the Corridor of land in the width of Right of Way between the towers at present.

Recommendations of the Guidelines issued by Ministry of Power, Govt. of India vide letter dated 15.10.2015 regarding payment of compensation towards damage in regards to RoW for Transmission lines will not be feasible to transmission line developmental activities in the State of Tripura.


This is for favour of your kind record please.

Yours faithfully,

(M. DeBbarma)

Director (Technical)
TSECL, Agartala

Other correspondences with TSECL in respect to RoW Compensation of 132kV Transmission lines are given below.



पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
**POWER GRID CORPORATION
OF INDIA LIMITED**
(A Government of India Enterprise) पावरग्रिड

दूरभाष : (0381)2330045 (*)
NERPSIP Office,
Ramnagar-06(Middle); 3rd Crossing, Agartala - 791002.
उत्तर पूर्वी क्षेत्र / NORTH EASTERN REGION
Date: 27/04/2018

Ref. : NEAGT/NERPSIP-101/2017-18/169

To,
The AGM(Transmission Circle)
Tripura State Electricity Corporation Limited
79 Tilla; Transmission Circle
Agartala, Tripura(W)

Sub: Compensation of 132kV Transmission line which are to be constructed under NERPSIP
Tripura-Reg.

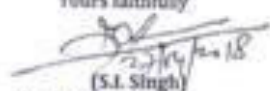
Dear Sir,

With reference to the above it is to inform you that there are 14 Nos. of 132kV Transmission line to be constructed in Tripura under NERPSIP Project.

The survey activities of all the Transmission Lines have been completed and the construction of the lines is being started shortly. For Finalization of Surface Damage Compensation to the affected land owners along the route of the Transmission line the following action may kindly be taken from your side:-

- 1) District Authority may kindly be intimated to depute their representative for identification and authentication of the land owner.
- 2) The rates of Tree/Crops compensation prevailing in Tripura State may kindly be provided for assessment of the compensation amount.
- 3) Authorized representative of TSECL may kindly be identified area wise/Line wise for signing of Compensation notice / assessment sheet etc.

The name of the lines where construction activity is being started is enclosed in Annexure-01.
Your early action in this regards is highly solicited.
Thanking you.

Yours faithfully

(S.I. Singh)
Dy. General Manager
POWERGRID, Agartala.

Copy for kind information to:-
1. CMD TSECL, Corporate Office, Banamalipur, Agartala.

Registered Office: B-9 Qutab Institute Area, Katwaria Sarai, New Delhi- 110016
Tel: 011-26560112, Fax: 26601081, Website: <http://www.powergridindia.com>
व्यक्ति एवं राष्ट्रहित मे सर्वोत्तम कार्य
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TSECL office order dated 04/05/2018 regarding nominated officials who are authorised to sign compensation notice for obtaining RoW and all Statutory Clearances for the corresponding Transmission lines

TRIPURA STATE ELECTRICITY CORPORATION LIMITED

(A Govt. of Tripura Enterprise)



No.F. 5(85) /AGM /TC /2018-19 / 2/9 - 239

Dated :- 4th May, 2018

ORDER

As per Clause No. 7.8 of the Implementation / Participation Agreement signed between Tripura State Electricity Corporation Limited (TSECL) & Power Grid Corporation of India Limited (PGCIL) on 13th March, 2015 regarding implementation of NER Power System Improvement Project (NERPSIP) pertaining to the State of Tripura, the Utility (TSECL) as Owner has the responsibilities of obtaining Right of Way (RoW) and all Statutory Clearances viz. Environment, Forest / River / Canal / Power Lines / Roads / Highways/ Railway Crossing, PTCC, Aviation, Electrical inspector etc. PowerGrid being the Implementing Agency will undertake all the activities for and on behalf of the Owner (TSECL) as well as provide technical / administrative assistance to TSECL to avail RoW / Clearances.

For smooth implementation of the Project, following Officials of TSECL are hereby authorized to sign on the compensation notice jointly with PowerGrid for obtaining Right of Way (RoW) and all Statutory Clearances for the corresponding Transmission Lines as mentioned below -

Sl. No	Name of Line	Name of Authorized Official	Address for Communication
1	132 KV D/C Bagata -Belonia Transmission Line	1. Sr. Manager, Banduar Sub-Station. 2. Sr. Manager / Manager, Bagata S/S. 3. Sr. Manager / Manager, Belonia S/S.	DGM, Transmission Division, Udaipur, Gomati District, Tripura.
2	132 KV S/C (on D/C Tower) - Bagata - Satchand Transmission line	1. Sr. Manager, Banduar Sub-Station. 2. Sr. Manager / Manager, Bagata S/S. 3. Sr. Manager / Manager, Satchand S/S.	
3	132 KV D/C Udaipur - Bagata Transmission line	1. Sr. Manager, Banduar Sub-Station. 2. Sr. Manager / Manager, Bagata S/S.	
4	132 KV D/C Udaipur to Amarpur Transmission line	1. Sr. Manager, Banduar Sub-Station. 2. Sr. Manager / Manager, Amarpur S/S.	
5	132 KV D/C Belonia to Sabroom Transmission line	1. Sr. Manager, Banduar Sub-Station. 2. Sr. Manager / Manager, Belonia S/S. 3. Sr. Manager / Manager, Sabroom S/S.	
6	132KV interconnection portion of 132 KV S/C Sabroom - Satchand Transmission Line at Sabroom end.	1. Sr. Manager, Banduar Sub-Station. 2. Sr. Manager / Manager, Sabroom S/S.	
7	132 KV interconnection portion of 132 KV S/C Sabroom - Satchand Transmission Line at Satchand end.	1. Sr. Manager, Banduar Sub-Station. 2. Sr. Manager / Manager, Satchand S/S.	
8	132 KV D/C Rabindranagar - Rokhia Transmission line	1. Sr. Manager, Rabindranagar S/S	DGM, Transmission Division, Agartala, 79 Tilla, West District, Tripura.
9	LILO of Surjannagar - Rokhia 132 KV line at Gokulnagar S/S	1. Sr. Manager, TSD, 79 Tilla, Agartala.	
10	LILO of 132 KV Agartala (79 Tilla) - Dhalai Transmission line at Mohanpur.	1. Sr. Manager, Transmission Sub-division, 79 Tilla, Agartala	

OFFICE OF THE ADDITIONAL GENERAL MANAGER, TRANSMISSION CIRCLE, 79 TILLA, AGARTALA
PHONE & FAX: 0381-235-1579

TRIPURA STATE ELECTRICITY CORPORATION LIMITED
(A Govt. of Tripura Enterprise)



Sl. No	Name of Line	Name of Authorized Official	Address for Communication
11	132 KV D/C Rabindranagar - Belonia Transmission line	1. Sr. Manager, Rabindranagar S/S. 2. Sr. Manager, Banduar S/S	1. DGM, Transmission Division, Agartala, 79 Tilla, West District, Tripura. 2. DGM, Transmission Division, Udaipur, Gomati District, Tripura
12	LILO of 132 KV S/C Ambassa - P.K. Bari Transmission Line at Manu S/S	1. Sr. Manager, Ambassa S/S	DGM, Transmission Division, Kumarghat, Unakoti District, Tripura.
13	132 KV interconnection portion from Manu (Old-existing) S/S to Manu (New) S/S for charging of 132 KV S/C Manu-Chawmanu TL.		
14	132 KV D/C Kalashahar- Dharmanagar Transmission line		

In addition, DGM, TD, Agartala / DGM, TD, Udaipur / DGM, TD, Kumarghat / DGM, P – II, / DGM, P – III, / DGM (Civil), / Sr. Manager (Civil), Planning, Transmission Circle, Agartala and Sr. Manager, Transmission Civil Sub-Division, Agartala are hereby instructed to redress Grievances / disputes, if any, for early resolve and smooth execution of the project.


 Addl. General Manager
 Transmission Circle, TSECL, Agartala
 04/05/18

Copy to:-

- 1-3) The DGM, TD, Agartala // Udaipur // Kumarghat for necessary action.
- 4-6) The DGM, P – II // DGM, P – III // DGM, Civil, TC, Agartala for necessary action.
- 7) The DGM, NERPSIP, PGCIL, Agartala for kind information and necessary action.
- 8-13) SM, Banduar S/Stn // SM, TSD, Agartala/ SM, Ambassa S/Stn // SM, Rabindranagar S/Stn // SM(Civil), Planning, TC, Agartala // SM, TSD(Civil), Agartala, for necessary action.
- 14-20) SM /M, MissionTila S/Stn, // SM /M, Gourmagar S/Stn, // SM /M, Bagata S/Stn, // SM /M, Belonia S/Stn, // SM /M, Satchand S/Stn, // SM /M, Sabroom S/Stn, // SM /M, Amarpur S/Stn, for necessary action.
- 21) Office order book.


 Addl. General Manager
 04/05/18

OFFICE OF THE ADDITIONAL GENERAL MANAGER, TRANSMISSION CIRCLE, 79 TILLA, AGARTALA
PHONE & FAX: 0381-235-1579

TSECL letters to Sub-Divisional Magistrate-Bishalgarh; Sadar & Mohanpur for Deployment of Tehsildar for Identification of affected Land owners for 132kV LILO line Rokhia-Surjamaninagar at 132kV Gokulnagar S/s & Agartala-Dhalabil at 132kV Mohanpur S/s, respectively.

**TRIPURA STATE ELECTRICITY CORPORATION LIMITED**
(A Govt. of Tripura Enterprise)

No.F.585/AGM/TC/2018-19/ 318-22 Date: 15-05-2018

To
The Sub-Divisional Magistrate
Bishalgarh Sub-Division
Dist-Sepahjala Tripura

Sub: Deployment of Tehsildar for identification of Land owner for Construction of 132KV LILO line of Rokhia - Surjamaninagar at 132KV Gokulnagar S/S.

Dear Sir,

This is to bring to your kind notice that Government of India has entrusted Power Grid Corporation of India Ltd.(A Government of India Enterprise) for the task of implementation of the North Eastern Region Power System Improvement Project (NERPSIP) in the State of Tripura. Under the said project various 132kV & 33kV Power Transmission Lines are to be constructed along-with the associated Substation in the State.

Tehsildar of Bikanranagar & Gokulnagar Tehsil may kindly be informed to extend their co-operation in order to identify the land owner en-route the 132kV LILO of Rokhia - Surjamaninagar Transmission line at Gokulnagar Substation under Bishalgarh Sub-Division.

NERPSIP being a time-bound Central Sector Project, your co-operation in this regard is highly solicited towards timely completion of the same.

Thanking you.

Yours faithfully,

DGM (NERPSIP), PowerGrid, Agartala
Transmission Circle
Agartala 15/05/18

Copy to:-
1) DM & Collector Sepahjala District, Bikanranagar for kind information.
2) DGM (NERPSIP), PowerGrid, Agartala.
3-4) DGM, TD, Agartala / DGM (TC), Transmission Circle, Agartala.


OFFICE OF THE COLLECTOR
M.C. 11A
18 MAY 2018
CT


Addl. General Manager
15/05/18

Addl.General Manager, Transmission Circle, 79 Tilla, Agartala, West Tripura, Tel. & Fax - (0381)225-1379

TRIPURA STATE ELECTRICITY CORPORATION LIMITED

(A Govt. of Tripura Enterprise)



No.F.5(85) / AGM / TC / 2018-19/ 382-87

Dated: 17-05-2018

To
The Sub-Divisional Magistrate
Mohonpur Sub-Division
Dist- West Tripura

Sub: Deployment of Tehsildar for identification of Land owner for Construction of 132kV LILO line of Agartala - Dhalabli at 132kV Mohonpur S/S.

Dear Sir,

This is to bring to your kind notice that Government of India has entrusted Power Grid Corporation of India Ltd. (A Government of India Enterprise) for the task of implementation of the North Eastern Region Power System Improvement Project (NERPSIP) in the State of Tripura. Under the said project various 132kV & 33kV Power Transmission Lines are to be constructed along-with the associated Substation in the State.

Tehsildar of Mohonpur Tehsil may kindly be informed to extend their co-operation in order to identify the land owner en-route the 132kV LILO of Agartala - Dhalabli Transmission line at Mohonpur Substation under Mohonpur Sub-Division.

NERPSIP being a time-bound Central Sector Project, your co-operation in this regard is highly solicited towards timely completion of the same.

Thanking you



Yours faithfully,

D. Basman
Addl. General Manager
Transmission Circle,
Agartala. 17/05/18

Copy to:-

- 1) DM & Collector, West Tripura District, for kind information.
- 2) DGM (NERPSIP), PowerGrid, Agartala.
- 3-4) DGM, TD, Agartala / DGM (Civil), Transmission Circle, Agartala.

Addl. General Manager

Addl. General Manager, Transmission Circle, 79 Tilla, Agartala, West Tripura, Tel. & Fax - (0381)235-1579



TRIPURA STATE ELECTRICITY CORPORATION LIMITED

(A Govt. of Tripura Enterprise)



No.F.5(85)/AGM/TC/2018-19/ 435-39

Dated: 21-05-2018

To
The Sub-Divisional Magistrate
Sadar Sub-Division
Dist- West Tripura

Sub: Deployment of Tehsildar for identification of Land owner for Construction of 132kV LILO line of Rokhia - Surjamaninagar at 132kV Gakulnagar S/S.

Dear Sir,

This is to bring to your kind notice that Government of India has entrusted Power Grid Corporation of India Ltd(A Government of India Enterprise) for the task of implementation of the North Eastern Region Power System Improvement Project (NERPSIP) in the State of Tripura. Under the said project various 132kV & 33kV Power Transmission Lines are to be constructed along-with the associated Substation in the State.

Tehsildar of Bikramnagar Tehsil may kindly be informed to extend co-operation in order to identify the land owner en-route the 132kV LILO of Rokhia - Surjamaninagar Transmission line at Gakulnagar Substation.

NERPSIP being a time-bound Central Sector Project, your co-operation in this regard is highly solicited towards timely completion of the same.

Thanking you.



Yours faithfully,

D. Barman
Add. General Manager
Transmission Circle
Agartala. 21/05/18

Copy to:-

- 1) The DM & Collector, West Tripura District, for kind information.
- 2) The DGM (NERPSIP), PowerGrid, Agartala.
- 3-4) The DGM, TD, Agartala / DGM (Civil), Transmission Circle, Agartala.

Copy to:-
1) The DM & Collector, West Tripura District, Agartala, Tripura.
CENTRAL RECEIPT
Dated: 21/5/18
Section: _____
Receipt No. _____

D. Barman
Add. General Manager
21/05/18

Draft notice for compensation for construction of 132kV Transmission lines under NERPSIP-Tripura

TRIPURA STATE ELECTRICITY CORPORATION LIMITED

(A Govt. of Tripura Enterprise)



No.F.5(86) (AGM/TC (2018-19) 323-29

Dated: 15-05-2018

To
The DGM (NERPSIP)
Power Grid Corporation of India Ltd.
Ramnagar-06, Agartala

Sub -> Forwarding of Draft Notice for compensation for construction of TL line under NERPSIP : Tripura.
Ref : - NEAGT / NERPSIP - 102 / 2017 - 18 / 213, dated 15.05.2018.

Sir,

With reference to the above, kindly find enclosed herewith the sample copy of Notice in Ann-01 & 02 to be used for Surface damage compensation & Land Compensation in respect of construction of Transmission Line under NERPSIP, Tripura.

It is further to be noted that each notice shall be of 5 copies (1 original & 4 Carbon Copy) and Joint signature of POWERGRID & TSECL in original to be put in all the copies of notice. After signing of notice, 1st copy to be handed over to the affected Land Owner, 2nd Copy will be kept at POWERGRID, 3rd & 4th Copies to be forwarded to respective DM & SDM for assessment, and 5th Copy to be handed over to TSECL.

Once assessment is completed and compensation amount is finalized from the respective District Administration, the payment shall be done by POWERGRID.

Thanking you.

Enclo- As stated above.

*Land notice is not
submitted.
Pl. collect.*

15/5/2018

Yours faithfully,

[Signature]
Add. General Manager
Transmission Circle
Agartala
15/05/18

Copy to:-

- 1-3) The DGM, TD, Agartala / Udaipur / Kumarghat.
- 4-6) The DGM, (P - II) / DGM (P - II) / DGM (Civil), Transmission Circle, Agartala.

Add. General Manager



TRIPURA STATE ELECTRICITY CORPORATION LIMITED

(A Govt. of Tripura Enterprise)



NOTICE

Ref No. :

Date : / /

To

Dear Sir / Madam

In exercise of power vested with TRIPURA STATE ELECTRICITY CORPORATION LIMITED (TSECL) under Section-154 of the Electricity Act, 2003 and Section 10 & 11 of the Indian Telegraph Act 1885 and amendment made up-to date thereto, this is to inform you that the proposed _____ Transmission line will be passing through your land and the properties belonging to you and standing in the required clearance belt of said transmission line will be cut / removed and the trees / crops belonging to you will have to be unavoidably damaged during the construction / erection of the line. If so desired by you, the trees / crops so felled / damaged will be handed over to you against recovery of salvage value of the felled trees/ crops etc. The compensation for the yield component of the tree(x) so fell and the crop(s) actually damaged will be paid to you as assessed by the Executive Magistrate or authority specified by the Appropriate Government.

i. Activities :

- a. Foundation Loc No. _____
 b. Erection Loc No. _____
 c. Stringing Loc No. from _____ to _____

ii. (1) Name of the Owner and Address:

- (2) Name of the Village / Mouza & J.L. No.
 (3) Name of PS & District
 (4) Plot No/ Khatian No

Particulars of trees /Crops / Other standing properties:

SL. No.	Item	Species	Dimension	Qty.
1)	Trees			
2)	Crops			
3)	Others			

Signature of the owner
Address :-

Signature of Power Grid Corp of India Ltd.

Signature of TSECL

Signature of Tehsildar

Witness :

Copy to :

- The D.M _____ for kind information please.
- The Deputy General Manager _____ for favour of kind information.
- The S.D.M. _____ for kind information. It is highly requested to assess the value of the said trees/crops etc. from his kind end and inform this office for payment of compensation.
- The Tehsildar, _____

Signature of TSECL

Address of the concern Division/ Communicating address



FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura




Annexure 9

Sample Copy of Land Compensation Notices 132kV D/c PK Bari - Ambassa TL

1. Location : LOC 3/0

TRIPURA STATE ELECTRICITY CORPORATION LIMITED
(A Govt. of Tripura Enterprise)



NOTICE

Ref No: **204** **04/204** Date: **16/10/2020**

To **RABINDRA REANG**

Sub :- Utilization of land for tower footing at Loc. No. **3/0**, type of tower **DD+0**, in connection with " **L.L.O. of B.K.N.S.C. Ambassa - P.K.B.** at Manu

Dear Sir,

As per section 67 of the Electricity Act, 2003, we require a portion of your land having the area mentioned below for construction of tower footings/stinging etc. related to the above-mentioned work. The Sub-Divisional Magistrate **LTV, Chaitanya** will assess necessary compensation in this respect.

Sl. No.	Name of owner as per document and other	Area of land utilization	Name of present occupier and relation
1	Name :- Rabindra Reang	84.180 m³	Rabindra Reang (owner)
2	Plot No. :- 2209/2528		
3	Khatian No. :- 240		
4	Jote No. :- 163		
5	Mouza :- Paschim Masli		

Signature of the Power Grid Corp of India Ltd. **BICKY KUMAR PAUL**
Name and Seal
BICKY KUMAR PAUL
FIELD ENGINEER
NERPSIP MANU

Signature of Tahsildar **Karamchra T.K.**
Name & Seal
LTV, (D) Tripura

Signature /Thumb impression of land Owner / Present Occupier
Address :-

Witness :- 1.
2.

Yours faithfully

Subir Debbarma
Signature of the TSECL
Name & Seal
Deputy General Manager
Transmission Division
Kumarghat, Unakoti, Tripura

Copy to :-


- The D.M. **Dhalai**..... for kind information please
- The Deputy General Manager, **BECL, T.D. KGT**... for favour of kind information.
- The S.D.M. **LTV, Chaitanya** for kind information. It is highly requested to assess the said land from his kind end and inform this office for payment of compensation.
- The Tehsildar, **Karamchra T.K.**

TRIPURA STATE ELECTRICITY CORPORATION LIMITED
Transmission Division, 79 Tilla, Agartala

Subir Debbarma
Signature of TSECL
Deputy General Manager
Transmission Division
Kumarghat, Unakoti, Tripura

2. Location : LOC 1B/0

TRIPURA STATE ELECTRICITY CORPORATION LIMITED
(A Govt. of Tripura Enterprise)


NOTICE

Ref No. : 205 05/205 Date : 14/10/2020

To PRABHAT SINHA

Sub :- S/O - Badal Sinha
Utilization of land for tower footing at Loc. No. 1B/0, type of tower B+D, in connection with "H.O. of K.B.2.K. 3/6 PRABHAT Ambassa" at Manu.

Dear Sir,

As per section 67 of the Electricity Act, 2003, we require a portion of your land having the area mentioned below for construction of tower footings/stinging etc. related to the above-mentioned work. The Sub-Divisional Magistrate LTV, Chaitanya will assess necessary compensation in this respect.

Sl. No.	Name of owner as per document and other	Area of land utilization	Name of present occupier and relation
1	Name :- <u>Prabhat Sinha</u>	52.66 sqm	<u>Prabhat Sinha</u> (owner by Power of Attorney)
2	Plot No. :- <u>209/2210</u>		
3	Khatian No. :- <u>224</u>		
4	Jote No. :- <u>230</u>		
5	Mouza :- <u>Paschim Masli</u>		

Signature of the Power Grid Corp. of India Ltd.
POWERGRID
BICKY KUMAR PAUL
Name and Seal
क्षेत्र अभियान्त/FIELD ENGINEER
NERPSIP MANU

Signature of Tehsildar
Name & Seal
Karamchara T.K.
LTV, (D) Tripura

Signature /Thumb impression of land Owner / Present Occupier
Address :-

Witness :- 1.
2.

Yours faithfully
Subir Debbarma
Signature of the TSECL
Name & Seal
Deputy General Manager
Transmission Division
Kumarenai, Unakoti, Tripura


Copy to :-
1. The D.M. Dhalai..... for kind information please
2. The Deputy General Manager, TSECL, I.D. KAT for favour of kind information.
3. The S.D.M. LTV, Chaitanya for kind information. It is highly requested to assess the said land from his kind end and inform this office for payment of compensation.
4. The Tehsildar, Karamchara.

TRIPURA STATE ELECTRICITY CORPORATION LIMITED
Transmission Division, 79 Tilla, Agartala

Sample NOC/ Affidavit from Land Owner

Location No. 38/0 of 132kV Bagafa - Satchand Line

SL No - 702/2020 14 FEB 2020



RECEIVED
Date: _____
Notary Dhalai

NOTARY
A. TIKKA
Notary, Dhalai
Dist. South Tripura

NOTARY
A. TIKKA
Notary, Dhalai
Dist. South Tripura

02AA 222234

AFFIDAVIT

We Sri Hemdhan Singh s/o Lt. Namohan Singh aged about 53 years, Sri Nirmal Singh s/o Lt. Namohan Singh aged about 60 years, Sri Anil Singh s/o Lt. Namohan Singh aged about 56 years, Sri Nilan Kumar Singh s/o Lt. Namohan Singh aged about 72 years all of vil. Sagarthari, P.O. Jemralhari P.S. Satchora, Dist. South Tripura, Son. Parul Singh (Datta) s/o Sri Arjun Datta of vil. & P.O. Krishnyamah, P.O. Dhalai Dist. South Tripura & aged about 58 years s.unt. Charubala Singh (Biswas) s/o Lt. Dighis Biswas of vil. Kalshi, P.O. Baikhara, Dist. South Tripura, aged about 55 years, by nationality Indian & hereby solemnly affirm and declare as follows:-

1. That, the Document No. 1 to 6 are the joint owners of the property bearing Khata No. 578, in plot No. 2011 situated at Karmalhari village, Nanjanali para Nodje under Theardhara Tehsil South Tripura District, in xxx cor show holding of Khata No. 578 and area of _____ sq. ft. of 132kV power line Corporation of India

Page 1 of 6

SL No 360
14 FEB 2020

NO. 1774 DATE 12 AUG 2018
STAMP ISSUED AT RS. 20/-
PURCHASED BY KRISHNA C. B. SINGH
..... DW/ADVOCATE

DEBABRATA CHAKRABORTY
STAMP VENDOR, AGARTALA

AFFIDAVIT

RESPECTFULLY AFFIRM & DECLARED RESPONSE

Sri Hemdhan Singh s/o Lt. Namohan Singh
S/o. Anil Singh s/o Lt. Namohan Singh
s/o. Nilan Kumar Singh s/o Lt. Namohan Singh
Age 53
District: Tripura
Identified by: Adv. Krishna C. B. Singh
This: 14th day of Feb. 2020
Dhalai 3.87 4M/PS

A. TIKKA
Notary, Dhalai
Dist. South Tripura

Hemdhan Singh
s/o Lt. Namohan Singh

Charubala Singh
s/o Lt. Dighis Biswas

Identified by
Adv. Krishna C. B. Singh
ADVOCATE, DHALAI
SOUTH TRIPURA
14/2/2020

Page 2 of 6



पावरग्रिड
POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and
North Tripura District under NERPSIP in Tripura



Annexure 10

**Sample Copy Tree/ Crop Compensation Notices
132kV D/C PK Bari Ambassa TL
132kV D/C Kailasahar Dharmanagar TL**

Location: 1B/0 - 132kV D/C PK Bari Ambassa TL
**TRIPURA STATE ELECTRICITY CORPORATION LIMITED
(A Govt. of Tripura Enterprise)**

Page No. : 217


NOTICE

Ref No. : 16/217

Date : 29/06/2020

 To **PRABHAT SINHA**

Dear Sir / Madam

S/O: BADAL SINHA

In exercise of power vested with TRIPURA STATE ELECTRICITY CORPORATION LIMITED (TSECL) under Section-164 of the Electricity Act, 2003 and Section 10 & 11 of the Indian Telegraph Act 1885 and amendment made up-to date thereto, this is to inform you that the proposed **132 kV D/C PK Bari Ambassa TL of North Tripura** Transmission line will be passing through your land and the properties belonging to you and standing in the required clearance belt of said transmission line will be cut / removed and the trees / crops belonging to you will have to be unavoidably damaged during the construction / erection of the line. If so desired by you, the trees / crops so felled / damaged will be handed over to you against recovery of salvage value of the felled trees/ crops etc. The compensation for the yield component of the tree(s) so fell and the crop(s) actually damaged will be paid to you as assessed by the Executive Magistrate or authority specified by the Appropriate Government.

I. Activities :

- a. Foundation Loc No: **1B/0**
 b. Erection Loc No. _____
 c. Stringing Loc No. from _____ to _____

- II. (1) Name of the Owner and Address: **PRABHAT SINHA**
 (2) Name of the Village / Mouza & J.L. No. **S/O BADAL SINHA**
 (3) Name of PS & District **KAILASHAR, GOLDAKUR, UNAKOTI, TRIPURA**
 (4) Plot No/ Khatian No **224**

Particulars of trees /Crops / Other standing properties:

SL. No.	Item	Species	Dimension	Qty.
1)	Trees	ARECANUT (Betelnut)	-	12 Nos
2)	Crops	Non Fruit Bearing	-	-
3)	Others	-	-	-
				Total: 12 Nos.

Prabhat Sinha

Signature of the owner


Address :-

Pradi P. Singh

Witness :

Copy to :

- The D.M. **Dhalai**..... for kind information please.
- The Deputy General Manager, **Pradi P. Singh, TSECL**..... for favour of kind information.
- The S.D.M., **L.T.V.**..... for kind information. It is highly requested to assess the value of the said trees/crops etc from his kind end and inform this office for payment of compensation.
- The Tehsildar, **Karamcherry, TR**


**पावरग्रिड
POWERGRID**
 BICKY KUMAR PAUL
 ज्येष्ठ अभियंता / SENIOR ENGINEER
 क्षेत्र आगमिका, NERPSIP मानक

Signature of Power Grid Corp. of India Ltd.

Signature of Tehsildar

Pradi P. Singh
 (Pradi P. Singh) Deputy General Manager
 Transmission Division
 Kumarghat, Unakoti, Tripura


Pradi P. Singh
 (Pradi P. Singh) Deputy General Manager
 Transmission Division
 Kumarghat, Unakoti, Tripura

DGM, Transmission Division, Kumarghat, District Unakoti, Tripura

Location: 1/0 to 1B/0 - 132kV D/C PK Bari Ambassa TL

TRIPURA STATE ELECTRICITY CORPORATION LIMITED
(A Govt. of Tripura Enterprise)

Page No. : 226


NOTICE

Ref No. : 25/226 Date : 24/11/2020

To **KANTI SEN, S/O- ABANISEN**

Dear Sir / Madam

In exercise of power vested with TRIPURA STATE ELECTRICITY CORPORATION LIMITED (TSECL) under Section-164 of the Electricity Act, 2003 and Section 10 & 11 of the Indian Telegraph Act 1885 and amendment made up-to date thereto, this is to inform you that the proposed **132 KV PK Bari-Ambassa TL to Ad. Abanisa**..... Transmission line will be passing through your land and the properties belonging to you and standing in the required clearance belt of said transmission line will be cut / removed and the trees / crops belonging to you will have to be unavoidably damaged during the construction / erection of the line. If so desired by you, the trees / crops so felled / damaged will be handed over to you against recovery of salvage value of the felled trees/ crops etc. The compensation for the yield component of the tree(s) so fell and the crop(s) actually damaged will be paid to you as assessed by the Executive Magistrate or authority specified by the Appropriate Government.

I. Activities :

a. Foundation Loc No: _____
b. Erection Loc No. _____
c. Stringing Loc No. from 1/0 to 1B/0 (Stringing of conductors)

II. (1) Name of the Owner and Address:
(2) Name of the Village / Mouza & J.L. No. Kanti Sen, Hospital Road, Hapania, West Tripura
(3) Name of PS & District Agartala, Tripura
(4) Plot No/ Khatian No 507/201/1520

Particulars of trees /Crops / Other standing properties:

SL. No.	Item	Species	Dimension	Qty.
1)	Trees	RUBBER	Age of Rubber 1. 5 th Year	18 NOS.
2)	Crops	- NA -	2. 7 th Year	03 NOS.
3)	Others	- NA -	Total : 21 NOS	

(Twenty One only)

Signature of the owner: Kanti Sen
Address: _____

Signature of Power Grid Corp. of India, Ltd. (NERPSIP MANAGER)
Signature of Tehsildar, Agartala, Tripura: Karamchra T.K. LTV, (D) Tripura

Signature of TSECL (E. Subi Debbarma)
Deputy General Manager
Transmission Division
Kumarghat, Unakoti, Tripura

Witness: _____
Copy to :
1. The D.M. Dhalai.....for kind information please.
2. The Deputy General Manager, 1B-0, PK Bari, Ambassa for favour of kind information.
3. The S.D.M. LTV, Agartala for kind information. It is highly requested to assess the value of the said trees/crops etc from his kind end and inform this office for payment of compensation.
4. The Tehsildar, Karamchra T.K.


Signature of TSECL (E. Subi Debbarma)
Deputy General Manager
Transmission Division
Kumarghat, Unakoti, Tripura

DGM, Transmission Division, Kumarghat, District Unakoti, Tripura

Location: 34/0 Kailasahr Dharmanagar 132/33kV TL

TRIPURA STATE ELECTRICITY CORPORATION LIMITED
(A Govt. of Tripura Enterprise)

Page-No. : 242


NOTICE

Ref No. : 42/242 Date: 05/04/2021

To **KSHITISH CHANDRA NANDI (owner)**

Dear Sir / Madam **S/o: Kshetra Mohan Nandi**

In exercise of power vested with TRIPURA STATE ELECTRICITY CORPORATION LIMITED (TSECL) under Section-164 of the Electricity Act, 2003 and Section 10 & 11 of the Indian Telegraph Act 1885 and amendment made up-to date thereto, this is to inform you that the proposed **132KV Kailasahr-Dharmanagar T/L**..... Transmission line will be passing through your land and the properties belonging to you and standing in the required clearance belt of said transmission line will be cut / removed and the trees / crops belonging to you will have to be unavoidably damaged during the construction / erection of the line. If so desired by you, the trees / crops so felled / damaged will be handed over to you against recovery of salvage value of the felled trees/ crops etc. The compensation for the yield component of the tree(s) so fell and the crop(s) actually damaged will be paid to you as assessed by the Executive Magistrate or authority specified by the Appropriate Government.

I. Activities :

a. Foundation Loc No: **34/0, DB+06(PS)**

b. Erection Loc No. _____

c. Stringing Loc No. from..... to.....

II. (1) Name of the Owner and Address:

(2) Name of the Village / Mouza & J.L. No. **09/174, Near Baza Fish Market**

(3) Name of PS & District **Dharmanagar, North Tripura.**

(4) Plot No/ Khatian No **3922/3641**

Particulars of trees /Crops / Other standing properties:

SL. No.	Item	Species	Dimension	Qty.
1)	Trees	NA		
		1. Chili	200 sq.m.	
2)	Crops	2. Betelnut	05 nos.	
		(Non Food Bearing)		
3)	Others			

Signature of the owner _____

Signature of Power Grid Corp. of India Ltd. _____

Signature of Tehsildar _____

Signature of TSECL _____

Witness : _____

Copy to :

- The D.M. North Tripura, for kind information please.
- The Deputy General Manager, TSECL, for favour of kind information.
- The S.D.M., Dharmanagar, for kind information. It is highly requested to assess the value of the said trees/crops etc from his kind end and inform this office for payment of compensation.
- The Tehsildar, Kameswar,

DGM, Transmission Division, Kumarghat, District Unakoti, Tripura

Compensation Payment Details – Kailasahar Dharmanagar 132/33kV TL

**POWER GRID CORPORATION OF INDIA LTD. NERPSIP
DETAILS OF COMPENSATION FOR TREE TOWARDS CONSTRUCTION OF 132KV Kailasahar-Dharmanagar TL (TR) TN-3**

S/n	Name and Address of the beneficiary	Address	Notice no	Date	Land (Khatra/da & no etc)	Loc n	Specification of Crops	Area of Surface Damage	Units	Rate (Rs)	Amount (Rs)	Bank Account no.	PPSC	IV no.	SPV NO	Date	Cheque no.	
1	Harentra Paul	S/o Lt Harentra	07/208	27.01.2020	792	27/0	Tonate (11/Year)	100 sq mt	0.01	790000	2,400.00	8079012354037	LTTR00R8R1C8	2300218320	2400154110	28.09.2024	CH480TP10	
2	Ranuprasad Paul	S/o Lt Harentra	08/209	27.01.2020	792	27/0	Tonate (11/Year)	100 sq mt	0.01	790000	7,500.00	0180010108127	LTTR00R1N9S1	2300218321	2400154713	28.09.2024	CH480TP14	
3	Sena Paul	S/o Srangshu	09/210	27.01.2020	792	27/0	Tonate (11/Year)	101 sq mt	0.01	790000	7,300.00	8079012354037	LTTR00R8R1C8	2300218322	2400154715	28.09.2024	CH480TP16	
4	Palanpur Debbarth	S/O Ladar Behnath C/o Gagan	15/216	18.08.2020	2406	18/0	Heripal (11/Year)	100 sq mt	0.04	800000	82,000.00	3278782330	SRN0000007	2300218323	2400154712	28.09.2024	CTR0822952	
5	Kannul Ranjan Nath	S/o Kannant Nath Ward no 2, Jharkheper, North Jama, 86234	10/211	15/02/20	66	21/0	oil Year 7th Year 8th Year	nos nos nos	3 4 3	5347.00 5133.00 4919.00	26,735.00 20,532.00 14,297.00	61024	LTTR00R1N9S1	2300218324	2400154711	28.09.2024	CH480TP18	
6	Ranjan Nath	S/o Kannul Nath, W-02, East Halborg Halborg, Dharmanagar	14/215	22.05.2020	1777/2169	20/00	7th Year 8th Year	nos nos	6 2	5133.00 4919.00	30,798.00 9,838.00	8079011890969	LTTR00R8R1C8	2300218325	2400154714	28.09.2024	CH480TP19	
7	Gopi Ranjan Nath	East Halborg Dharmanagar, North Tripura	13/214	22.05.2020	740	23/0	Casnut (oil fruit bearing) Ancanut (Non fruit bearing)	nos nos	2 3	1303.00 804.00	3,006.00 2,412.00	8079011831430	LTTR00R8R1C8	2300218326	2400154709	28.09.2024	CH480TP01	
8	Rina Rala Nath	East Halborg, Dharmanagar, North Tripura	12/213	22.05.2020	76	23/0	Banboo (Baraki) Ancanut (oil fruit bearing) Ancanut (Non fruit bearing)	nos (per hmt) nos nos	54 2 5	1303.00 804.00 2.05	1,110.00 3,006.00 4,020.00	8079011897729	LTTR00R8R1C8	2300218327	2400154708	28.09.2024	CH480TP67	
9	Sagit Nath	S/o Lallu Nath, W-01, East Halborg, Dharmanagar, North Tripura	11/212	22.05.2020	1304/91	23/0	Banboo (Baraki) Papaya (Fruit bearing) Ancanut (Non fruit bearing)	nos (per hmt) nos nos	63 5 4	2.05 712.00 804.00	174.00 3,560.00 3,216.00	8079011831967	LTTR00R8R1C8	2300218328	2400154716	28.09.2024	CH480TP148	
											2,19,441.00							

(Signature)
28.09.2020

(Signature)
28/09/20

(Signature)
28/09/2020



पावरग्रिड
POWERGRID

FEAR for T&D subprojects in Gomati and South
North Tripura District under NERPSIP in Tripura



Annexure 11

Tree Compensation Process

Tree Cutting in Non Forest Area

No. F.7 (200)/For/FP-2000-09/ 19,611 - 29

GOVERNMENT OF TRIPURA
FOREST DEPARTMENT

Dated: 20/10/2010, 2010.

NOTIFICATION

Whereas the Hon'ble Supreme Court of India vide order dated 12.5.2001 in Writ Petition (Civil) No. 202/ 1995 had directed, inter-alia, that guidelines/rules be framed regarding extraction of trees from non-forest areas including plantations on non-forest areas;

Whereas in pursuance of the said directives, the State Government framed the guidelines on extraction of trees from non-forest areas vide notification No.F.7 (44)/For/FP-2001/PT-II/29,042 dated 17.01.2002;

Whereas in view of certain operational difficulties in implementation of the guidelines, it was deemed necessary to revise the aforesaid guidelines and revised guidelines duly approved Council of Ministers were referred to Ministry of Environment & Forests, Govt. of India vide this office letter No.F.7 (200)/For/FP-2k-2009/1110 dated 24th March, 2010 for concurrence.

Whereas the Ministry of Environment & Forests, Govt. of India has concurred the revised guidelines vide letter F.No.8-24/2010-FP dated 23rd September, 2010 with certain modifications and same was incorporated in the draft guidelines. Now therefore in exercise of all the enabling powers the following guidelines are hereby laid down by the State Govt. of Tripura with immediate effect.

- 1.1 These guidelines shall be called the "Guidelines for extraction of trees from non-forest areas"
 - 1.2 These shall extend to the whole of the State in respect of extraction of trees from non-forest areas.
 - 1.3 These shall come into effect from the date of their notification in the official gazette
2. **DEFINITION:**

In these guidelines, unless there is anything repugnant to the subjects or context

- (a) "Government" means Government of Tripura.
- (b) 'Forest' means (i) Reserved forest or Protected Forest or any other areas legally constituted as 'forest'; and (ii) any area recorded as 'Forest' in Government records maintained by Forest Department or other Govt. Departments and (iii) deemed forest area identified as per Supreme Court order dated 12.12.96 in Writ Petition (C) No. 202/95.
- (c) "Non-forest area" for the purpose of these guidelines means land, which is not 'Forest' as per 2 (b) above.
- (d) "Authorized officer" means the officer as prescribed by the Forest Department.
- (e) "PCCF" means Head of the Forest Department of Tripura.

(f) "Extraction" means felling and/or transportation of trees, including timber and firewood derived there from, away from the plot of land, where the trees stand or where these were felled.

(g) "Domestic use/purpose" means use of produce for one own use excluding sale.

(h) "Marking Rules" means Tripura Forest (Timber Marking) Rules, 1985 and amendments made thereto from time to time.

3. REGISTRATION OF TREES FOR PERMISSION FOR EXTRACTION:

3.1 For permission of extraction of trees standing on any plot of non-forest area, the owner of the plot who wants to extract trees shall get the trees registered with authorized officer in the manner as may be prescribed in this behalf by the State Government.

3.2 Application for registration of trees shall be made to the concerned authorized officer through the concerned Range Officer in the prescribed application Form along with prescribed Registration fee.

3.3 While registering a plot with trees standing thereon, it shall be, inter-alia, ensured that the applicant is the legal titleholder; and it is a non-forest area as per Para-2 (c) above.

3.4 Processing of applications; enquiry in to the status of land and trees standing there upon; and felling and extraction shall be carried out in accordance with instructions issued by Forest Department from time to time.

3.5 Tree registration shall remain valid for 7 (seven) years. After this period, registration shall have to be done afresh.

3.6 No registration shall be required for cases mentioned under "Special Provisions".

4. TREES NOT REQUIRING TREE REGISTRATION CERTIFICATES AND EXTRACTION PERMISSION

4.1 No permission from Forest Department will be needed for extraction of trees from non-forest land in the following cases.

a) For tree species namely Aam (*Mangifera indica*), Lichi (*litchi chinensis*), Sajna (*moringa oleifera*), Guava (*psidium guajava*)

The owner will, however, be required to intimate the local Range Officer at least 10 days in advance in Form prescribed by Forest Department about such intention.

4.2 The State Govt. shall be competent to add or delete species in Para 4.1 above.

5. PROCEDURE FOR EXTRACTION OF RUBBER TREES

No registration shall be required for felling of rubber trees. The procedure for extraction of rubber trees shall be separately prescribed by the Forest Department.

6. Service Charge:

Service charge shall be realized by the Forest Department from the owners of the trees for rendering the service on account of verification of the land, marking of trees namely stand marking, log marking and sale marking, issue of transit pass, etc. at the rates prescribed by State Government from time to time.

7. **SPECIAL PROVISIONS:**

Permission of following kinds in the context of non-forest land as per para 2(c) above may be issued by the Authorized officer on receipt of application from legal title holder. Such permissions shall not be considered repugnant to contrary provisions in para (3).

- a. Permission for extraction of such trees from non-forest land that pose danger to the human life and property may be accorded within 10 days from the date of receipt of application from the owner.
- b. Action for extraction of trees from non-forest land which is also Govt. land for construction of Govt. buildings, roads including widening of roads, bridges and railway lines, etc. shall be taken within 45 days from the date of receipt of the complete application from the user agency. Extraction and disposal of felled trees will be done by the Forest Department and revenue collected by way of sale of such timber etc. will be deposited by the Forest Department in the Government exchequer.
- c. One time permission for extraction of 5 trees for domestic use from plots of non-forest land which are not contiguous to forest land.
- d. In habitation areas, public places, roads where the trees have fallen due to natural causes like storm, decay of the tree, etc., causing severe inconvenience to people, the owner will be free to displace the same after giving intimation in writing to the Authorized officer. In other places, where trees have fallen due to such natural causes, intimation shall be given by the owner to the Authorized officer. The Authorized officer shall first causes enquiry and if he is satisfied with natural cause of the fall of tree/trees, he may allow extraction after recoding the reasons within 20 (twenty) days.

8. **CONFISCATION OF TREES FELLED IN VIOLATION OF GUIDELINES**

- 8.1 Timber obtained from trees felled in violation of these guidelines shall be seized by the Forest Department.
- 8.2 On enquiry, if the trees are found felled from:
 - a. Private land, the Authorized officer shall be at liberty to release the timber obtained from such trees, to the legal title holder(s), after recovery of an amount equal to 25% of the royalty payable for the tree/timber. However, such released timber shall not be eligible for purchase or use by any wood based unit, traders or registered timber transporters.
 - b. Govt. land/ Forest land, these shall be deemed to have been confiscated to the State Government.
- 8.3 For verification and recovery of the timber mentioned in para 8.1 above the staff of the Forest Department shall have the authority to enter the plot of land where the trees were felled and the Authorized officer shall have the authority to issue search warrants to his staff to search the premises, including houses, concerned.
- 8.4 The seizure of timber as per 8.1 above shall be without prejudice to any other action, including legal action or prosecution in a court of law.

9. **REPEAL AND SAVINGS:**

This is issued in supersession of guidelines and executive orders issued earlier on this matter.


The registration certificates already issued regarding trees on different plots as per guidelines communicated vide no F.7 (44)/For/FP/2001/PT-II/29042, dated 17th January, 2002 will however continue to remain valid.

By order of the Governor.


Chief Secretary,
Government of Tripura

Copy to:

1. The Principal Secretary to the Governor, Tripura for favour of information of the Governor, Tripura.
2. The Principal Secretary to the Chief Minister, Tripura for favour of information of the Chief Minister, Tripura.
3. The P.S. to the Minister for Finance, Tripura for favour of information of the Minister for Finance, Tripura.
4. The P.S. to the Minister for Forests Tripura for favour of information of the Minister for Forests, Tripura.
5. The P.S. to the Minister for Planning, Tripura for favour of information of the Minister for Planning, Tripura.
6. The S.A. to the Chief Secretary, Tripura for favour of information of the Chief Secretary, Tripura.
7. The Principal Chief Conservator of Forests, Tripura.
8. The Principal Secretary, Planning, Tripura.
9. The Principal Secretary, Finance, Tripura.
10. The Chief Wildlife Warden, Tripura.
11. The Inspector General of Forests (Forest Conservation), Ministry of Environment & Forests, Paryavaran Bhawan, CGO Complex, New Delhi.
12. The Addl. Principal Chief Conservator of Forests (Central), Ministry of Environment & Forests, North Eastern Regional office, Law-U-Sib, Lumbatngen, Near M.T.C. Workshop, Shillong 793 021.
13. The Chief Conservator of Forests (Planning & Development), Tripura.
14. The Nodal Officer, Forest (Conservation) Act, Tripura.
15. The Chief Conservator of Forests (Administration), Tripura.
16. The Additional/ Joint Secretary, Forests, Tripura.
17. The Manager, United Bank of India, Agartala.
18. The Manager, Government Press, Agartala for publishing in Tripura Gazette.


(E. K. Das) 20.10.10
Joint Secretary to the
Government of Tripura

**TREE / CROP/ TOWER FOOTING COMPENSATION PROCESS
(OTHER THAN FOREST LAND COMPENSATION)**

As per the provisions of Electricity Act, 2003 and Indian Telegraph Act 1885, land for tower and right of way is not acquired and agricultural activities are allowed to continue. However, the acts also stipulate that licensee shall pay full compensation to all interested for any damages sustained during the execution of said work. Accordingly, TSECL pays compensation to land owners towards damages if any during implementation of transmission project as well as during operation and maintenance phase. TSECL follows the principle of avoidance, minimization and mitigation in the construction of line in agricultural field having crop due to inherent flexibility in phasing the construction activity and tries to defer construction in cropped area to facilitate crop harvesting. However, if it is unavoidable and is likely to affect project schedule, compensation is given at market rate for standing crops. All efforts are also taken to minimize the crop damage to the extent possible in such cases. As regards trees coming in the Right of Way (RoW) following procedure is adopted for enumeration: All the trees which are coming within the clearance belt of ROW on either side of the center line are identified and marked/numbered from one AP (Affected Person) to the other and documented. Type, Girth (Measured 1 m. above ground level), approximate height of the tree is also noted for each tree. Trees belonging to Govt., Forest, Highways and other local bodies may be separately noted down or timely follow up with the concerned authorities for inspection and removal. Cashew, Guava, Lemon and other hybrid trees which are not of tall growing nature are not marked for cutting since these trees can be crossed using standard tower extensions if required. TSECL also pay compensation to affected land owners for utilization of their land for tower footing.

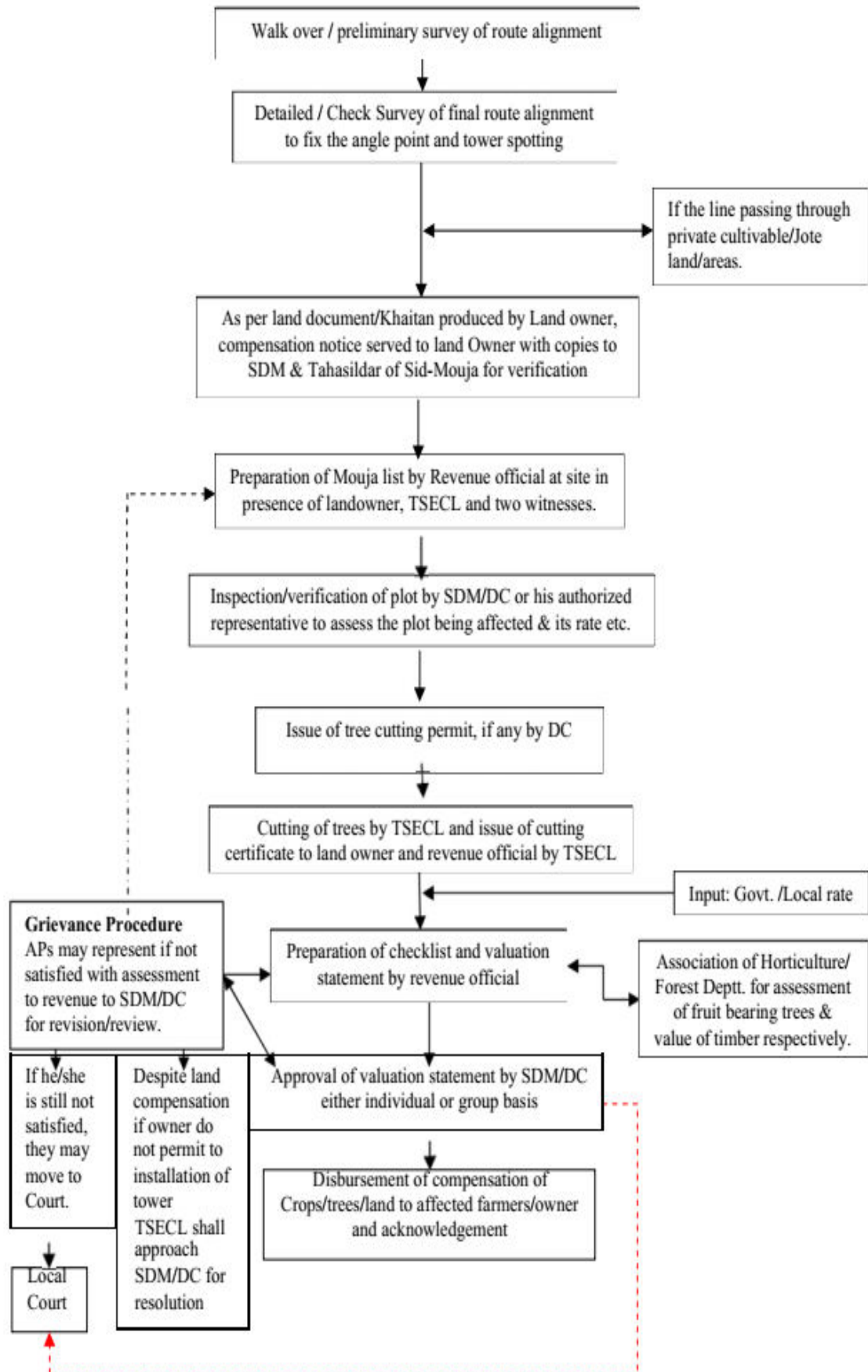
A notice under Electricity Act, 2003/ Indian Telegraph Act, 1885 is served to the landowners informing that the proposed transmission line is being routed through the property of the individual concerned. The notice shall contain the particulars of the land, ownership details and the details of the trees/crops/land inevitability likely to be damaged during the course of the construction of the proposed transmission line and acknowledgement received from land owners. A copy of said notice is further issued to the Revenue Officer/SDM, who has been authorized by the Tripura Govt. for the purpose of assessment/valuation and disbursement of compensation to the affected parties.

The revenue officer shall further issue a notice of intimation to the concerned land owner and inspect the site to verify the documents related to the proof of ownership and a detailed Mouja list is prepared for the identified trees/ crops/ land for tower footing inevitability damaged during the course of the construction. For assessing the true value of timber yielding trees help of forest officials is taken and for fruit bearing trees help of Horticulture department is taken.

The Mouja list shall contain the land owner details including extent land area utilization for tower footing, type of tree/crop, its present age, variety, yielding pattern etc. and the same is prepared at site in the presence of the land owner. These Mouja lists are further compiled and a random verification is conducted by the concerned DC or his authorized representative in order to ascertain the assessment carried out by the revenue office is genuine and correct. After this process the District Collector/ a tree cutting permit to

TSECL to enable removal / damage to the standing tree/crop identified in the line corridor. Similarly on the basis of enquiry report received from concerned Tehsildar, SDM issue land valuation certificate to TSECL for payment of compensation to land owner. Once the tree/crop is removed / damaged, TSECL shall issue a tree cutting/crop damaged notice to the land owner with a copy to the Revenue Officer to process the compensation payment. Based on the above the compensation payment is generated by means of a computerized programme developed by the National Informatics Center exclusively for this purpose. The detailed Valuation statement thus generated using this programme is verified at various levels and approval of payment of compensation is accorded by the concerned District Collectors.

On approval of compensation, the revenue officer shall further intimate the amount payable to the different landowners and TSECL arranges the payment by way of Demand Draft to the affected parties. The payment is further disbursed at the local village office after due verification of the documents in presence of other witnesses.



Budget Estimation

BUDGET ESTIMATE TOWARDS FOREST AND CROP/TREE/ TOWER FOOTING COMPENSATION

Total 132 kV T/L length	-	22.5 km
Total 132 kV tower locations	-	75 approx.
 A. Compensation		
1 Forest		- Rs. 3140.00 lakhs.
2. Crop & Trees		
- 132 kV T/L length in Private /Revenue land – 16.7 kms		
- Crop/tree compensation for 132 kV line- (16.7 km @ Rs.5,00,000/-)	-	Rs. 83.50 lakhs
- Distribution Line length in Private/Revenue land – 65.7 km.		
- Crop/tree compensation for 33 kV line -(67.5km @ Rs. 50,000/-)	-	Rs. 33.75 lakhs
 3. Land compensation for 132 kV tower footing-(75 towers@ Rs 13,600/-)		 Rs 10.20 lakhs
 Sub Total - A (1+2+3)		 - Rs. 3267.45 lakhs
 B. Implementation Monitoring & Audit		
i) Man-power involved for EMP implementation & Monitoring in entire route of transmission Line (Rs.10, 000/- x 88.2 km)		 = Rs. 8.20 lakhs
ii) Independent Audit (LS) if needed		= Rs. 10.00 lakhs
 Sub Total - B		 - Rs. 18.20 lakhs
 GrandTotal (A+B)		 = Rs. 3285.65 lakhs



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FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



Annexure 12

Drainage System / Mechanism for Sub-Station:

Sample Drainage layout of Gokulnagar S/s



Sample Drainage layout of Rabindranagar S/s

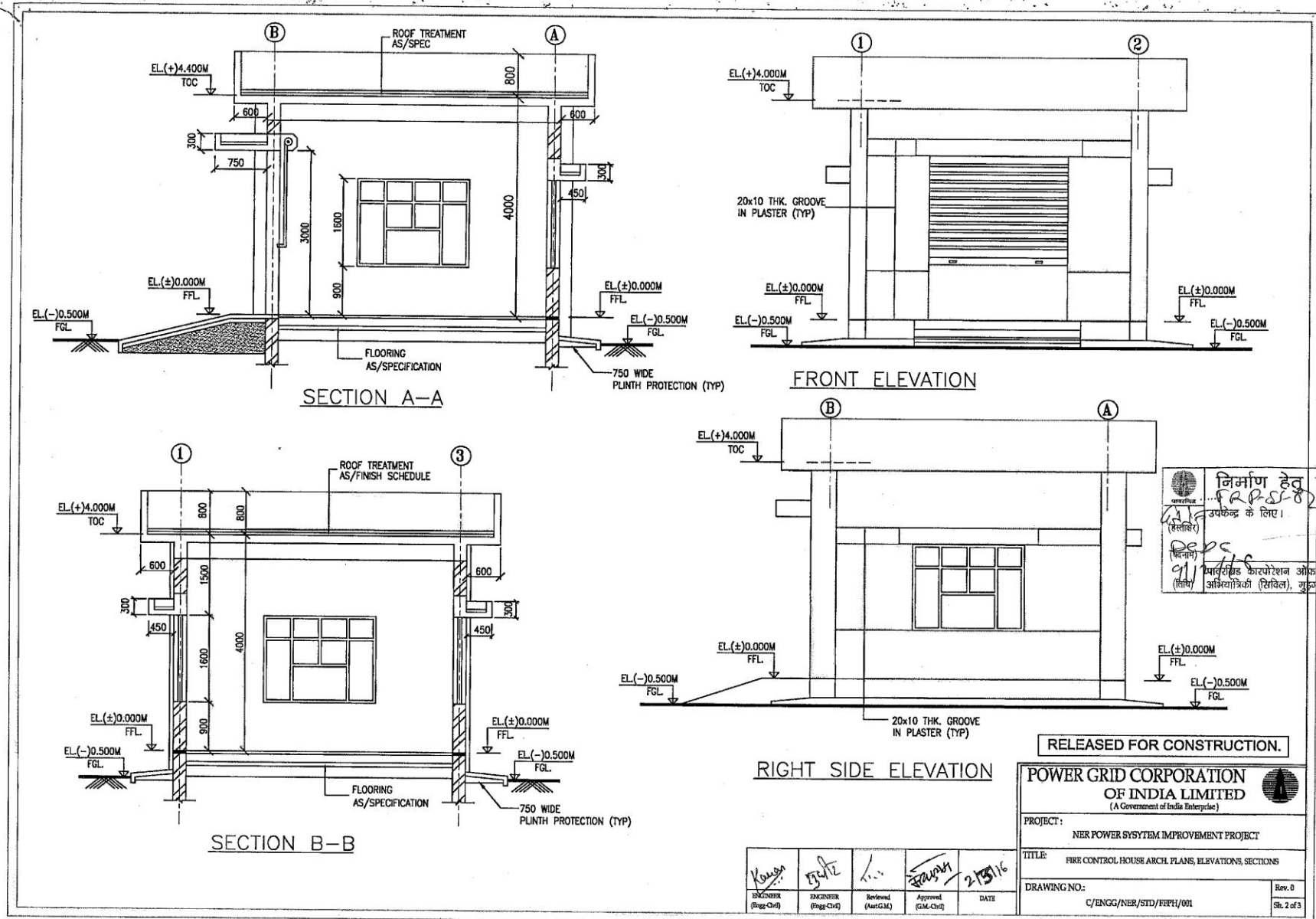


Sample Drainage layout of Mohanpur S/s



Annexure 13

Fire Fighting System



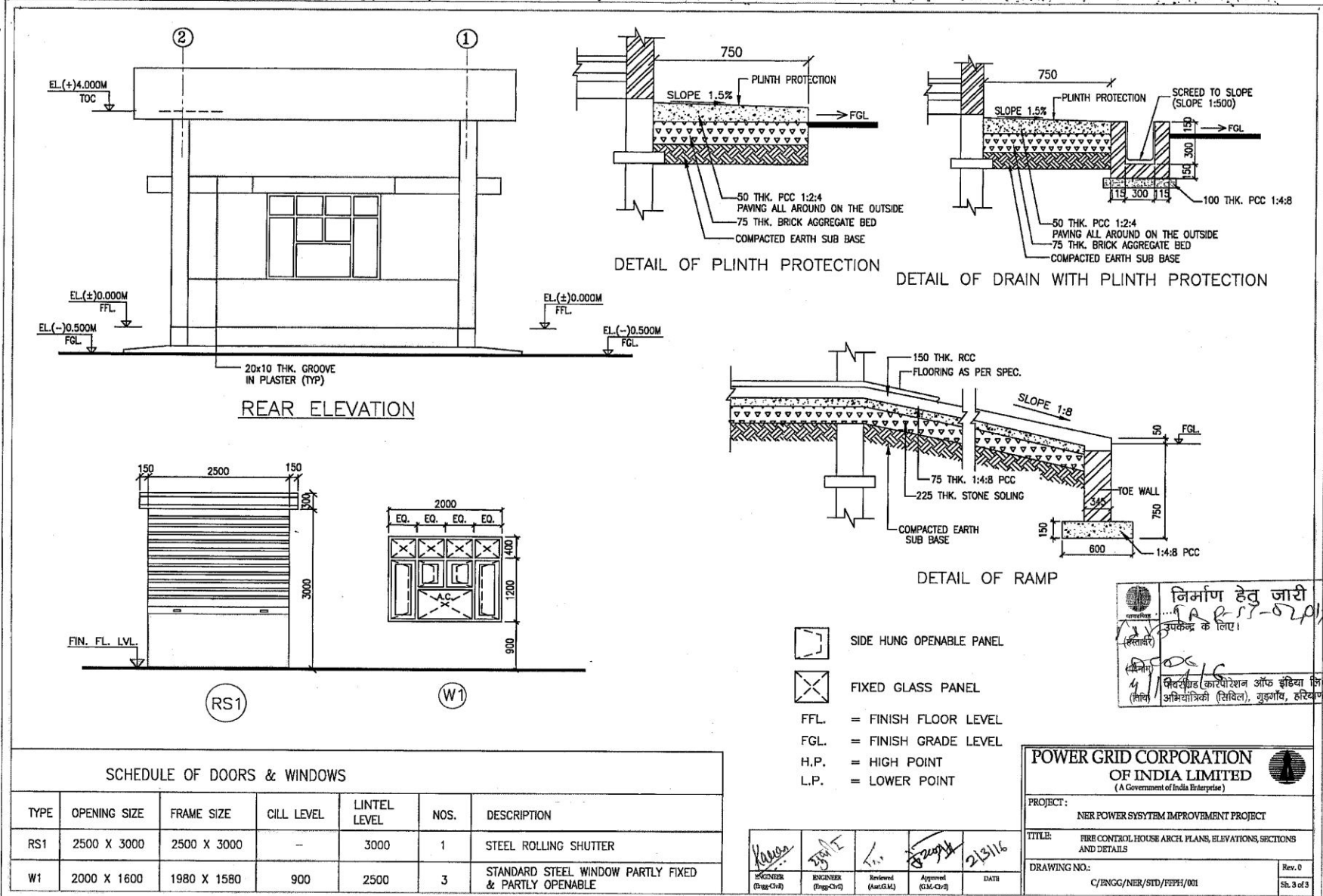
निर्माण हेतु जारी
FRPS-82/01/03
उपरोक्त के लिए।
DPS
भारतीय विद्युत नियंत्रण आयोग इंदिरा वि०
(सिवा) अभियांत्रिकी (सिविल), मुंबई, हरियाणा

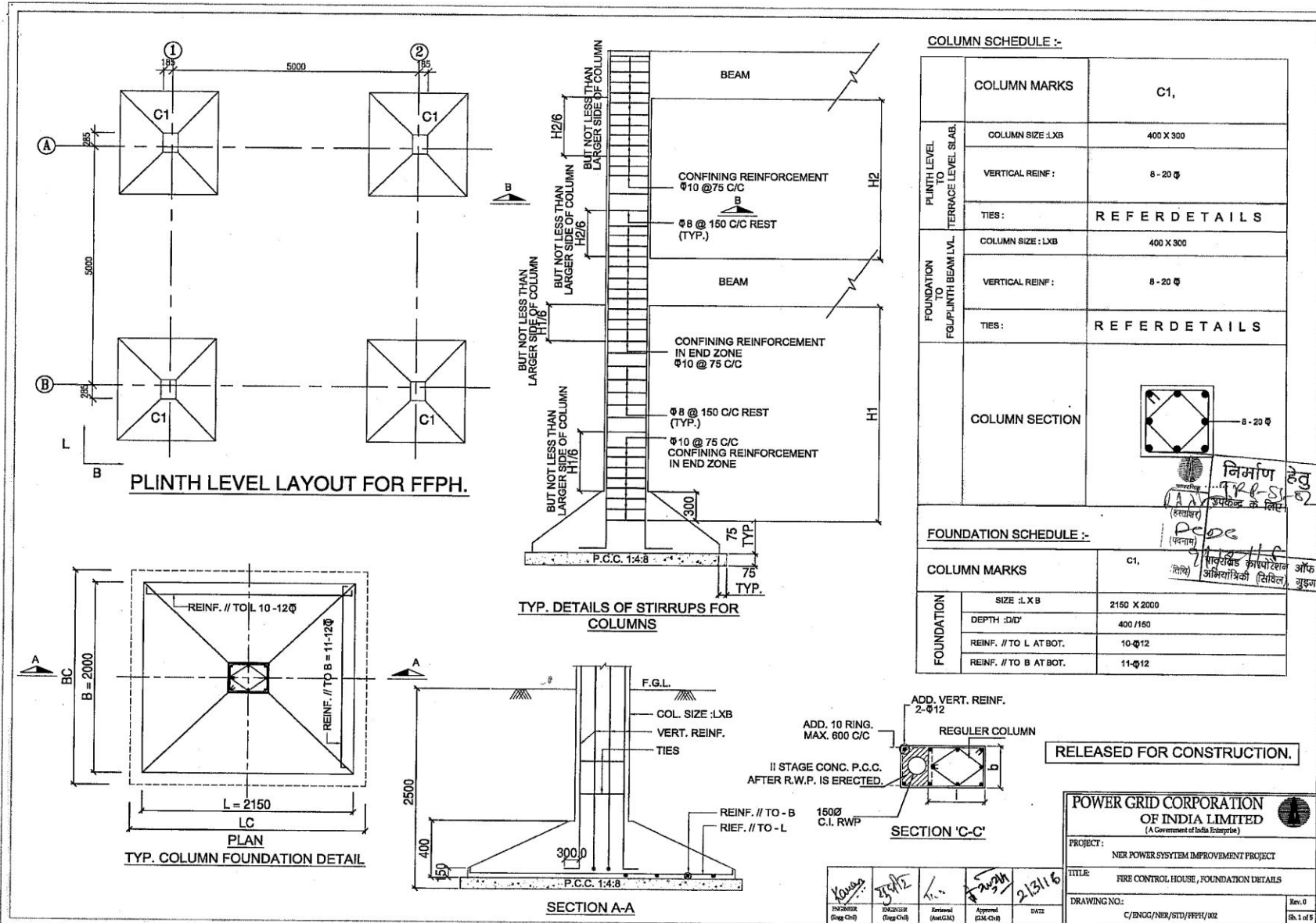
RELEASED FOR CONSTRUCTION.

**POWER GRID CORPORATION
OF INDIA LIMITED**
(A Government of India Enterprise)

PROJECT: NER POWER SYSTEM IMPROVEMENT PROJECT
TITLE: FIRE CONTROL HOUSE ARCH. PLANS, ELEVATIONS, SECTIONS
DRAWING NO: C/ENGG/NER/STD/EIPH/001
Rev. D
Sht. 2 of 3

<i>Kanwar</i>	<i>Prate</i>	<i>T.S.</i>	<i>Prasanna</i>	2/13/16
DESIGNER (Sgtt. Chk)	ENGINEER (Sgtt. Chk)	Reviewed (Asst.G.M.)	Approved (G.M.-Chk)	DATE





COLUMN SCHEDULE :-

	COLUMN MARKS	C1,
PLINTH LEVEL TO TERRACE LEVEL SLAB.	COLUMN SIZE :LXB	400 X 300
	VERTICAL REINF :	8 - 20 Φ
	TIES :	REFER DETAILS
FOUNDATION TO FLOOR PLINTH BEAM LVL.	COLUMN SIZE : LXB	400 X 300
	VERTICAL REINF :	8 - 20 Φ
	TIES :	REFER DETAILS
COLUMN SECTION		

FOUNDATION SCHEDULE :-

	COLUMN MARKS	C1,
FOUNDATION	SIZE :L X B	2150 X 2000
	DEPTH :D/D'	400 /160
	REINF. // TO L AT BOT.	10- Φ 12
	REINF. // TO B AT BOT.	11- Φ 12

निर्माण हेतु जारी
 22/01/03
 PCC
 (फ्लोरिंग)
 पावरग्रिड कॉर्पोरेशन ऑफ इंडिया लि.
 अभियांत्रिकी (सिविल), गुडगांव, हरियाणा

RELEASED FOR CONSTRUCTION.

POWER GRID CORPORATION OF INDIA LIMITED
 (A Government of India Enterprise)

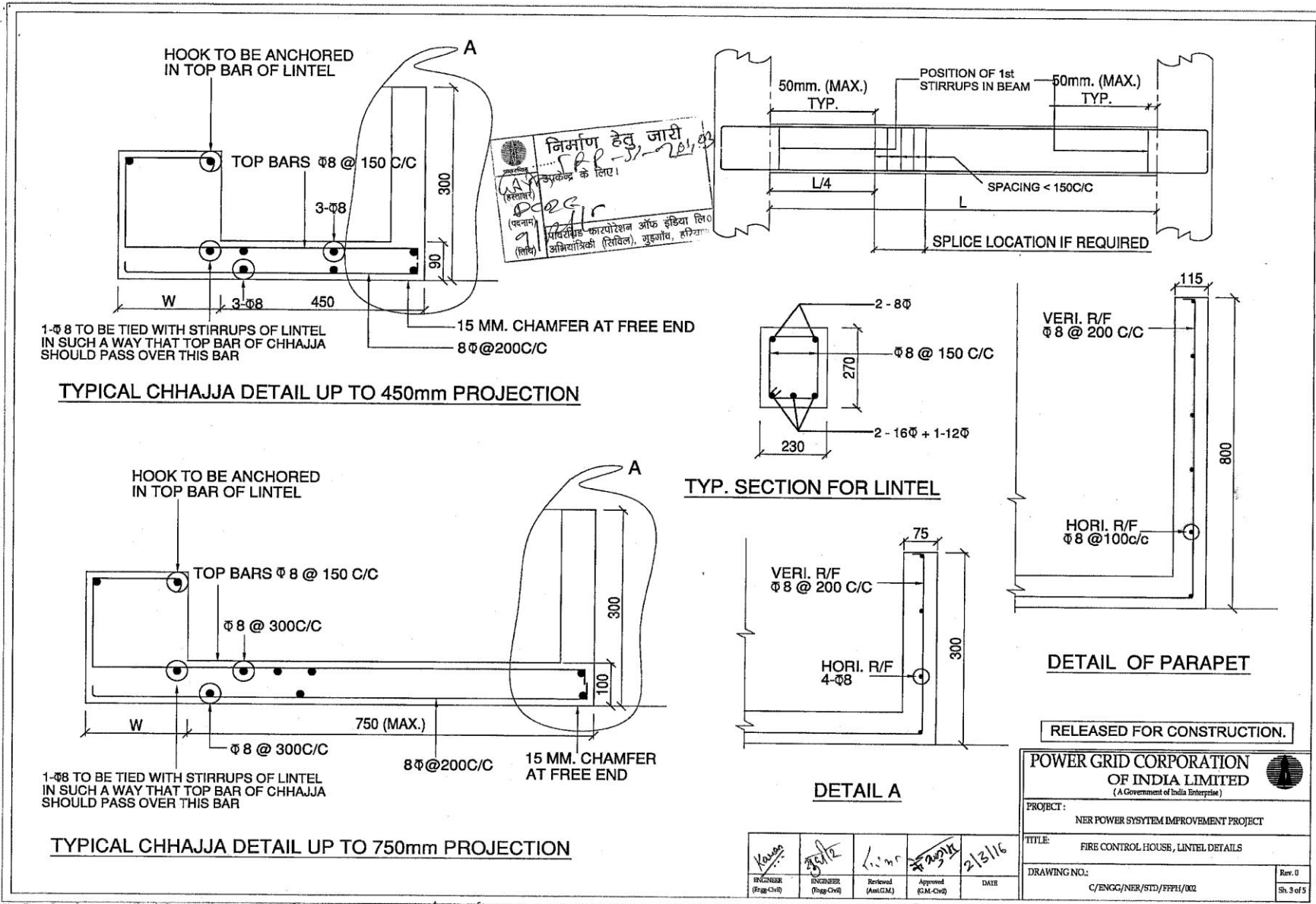
PROJECT: NER POWER SYSTEM IMPROVEMENT PROJECT

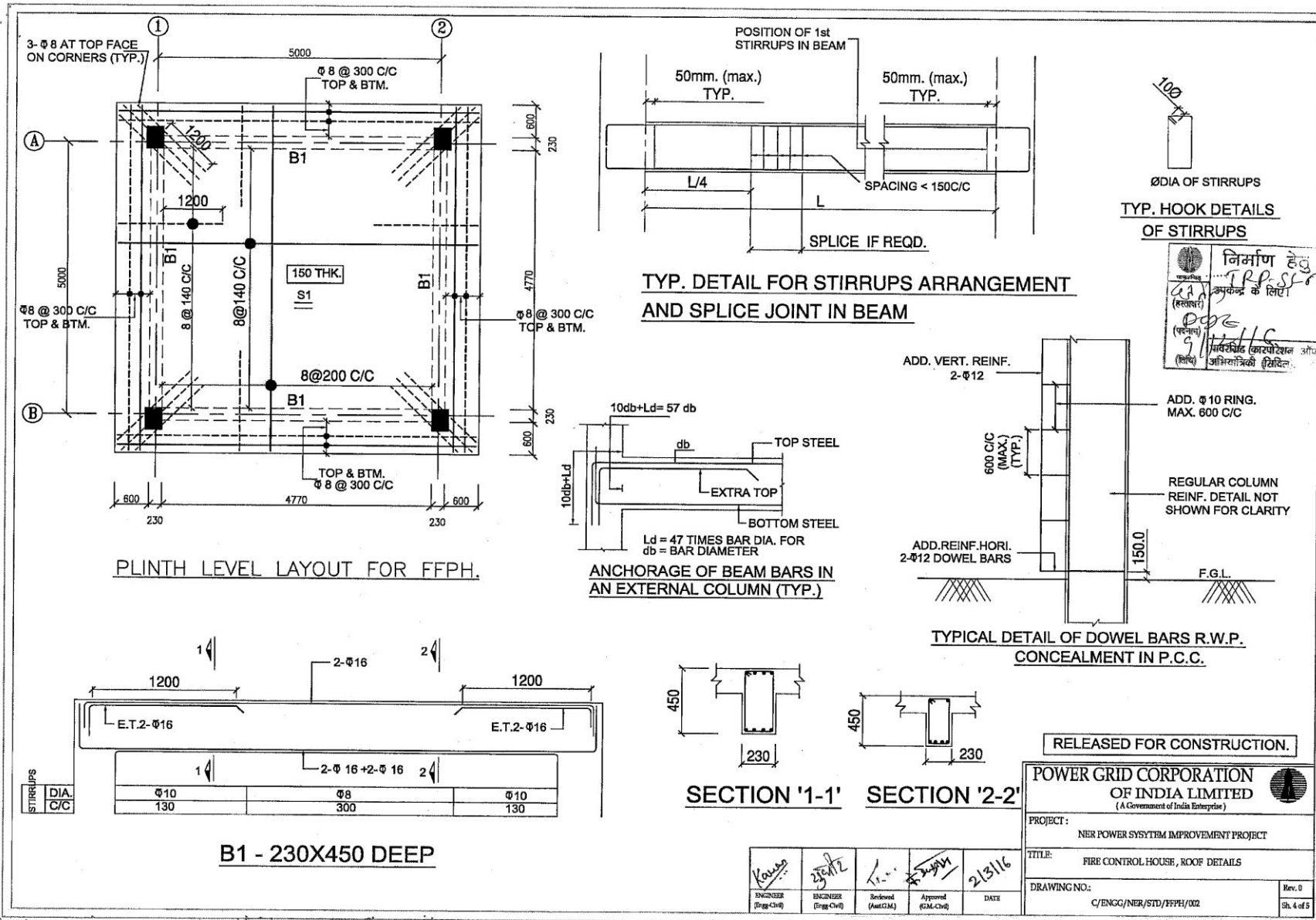
TITLE: FIRE CONTROL HOUSE, FOUNDATION DETAILS

DRAWING NO.: C/BNCC/NER/STD/FFPH/002

Rev. 0 (Sh. 1 of 5)

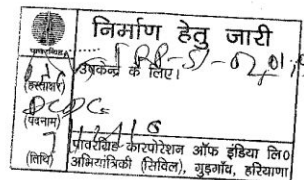
DATE: 21/3/16	APPROVED: [Signature]	DESIGNED: [Signature]	DRAWN: [Signature]
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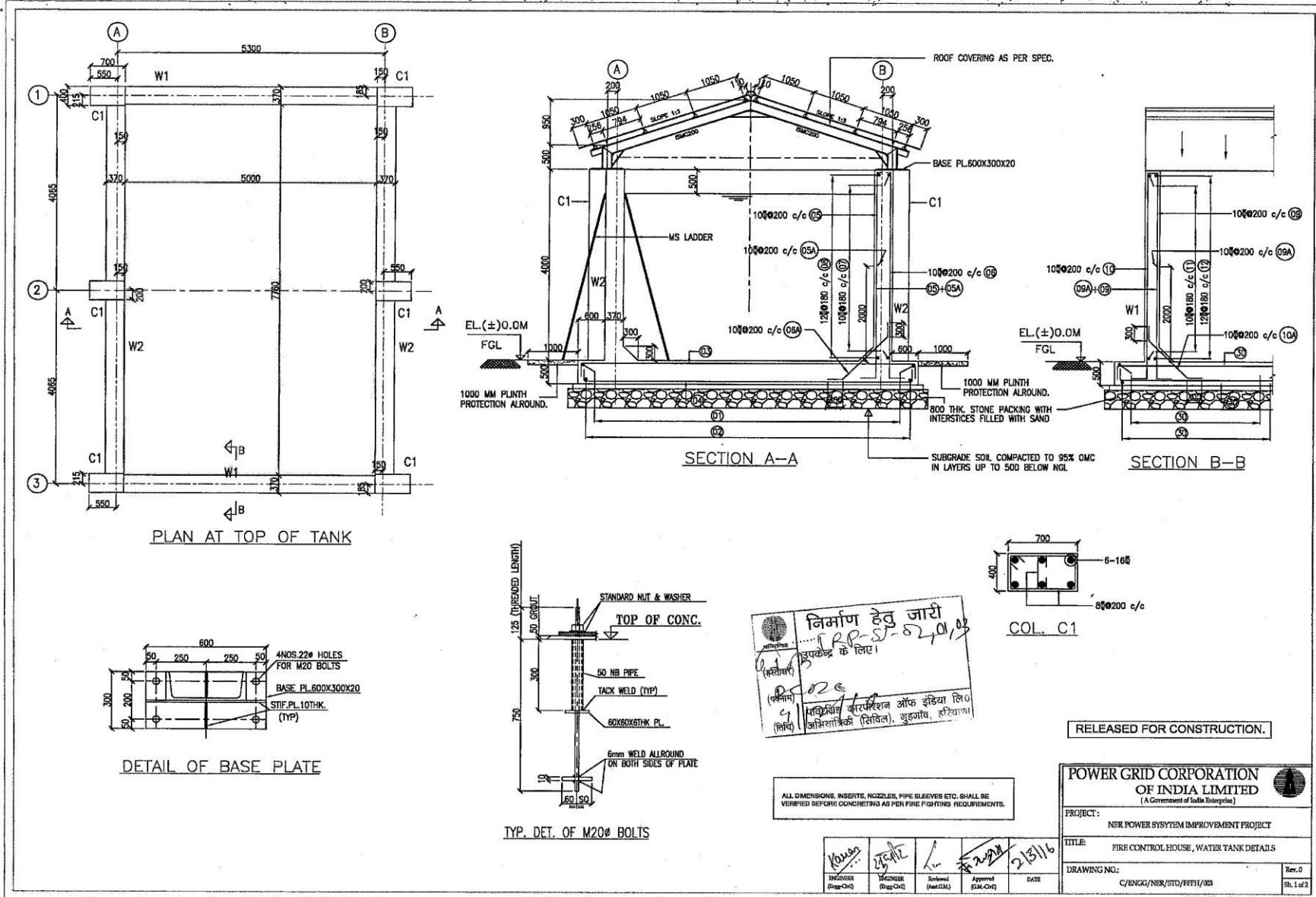
GENERAL NOTES:-

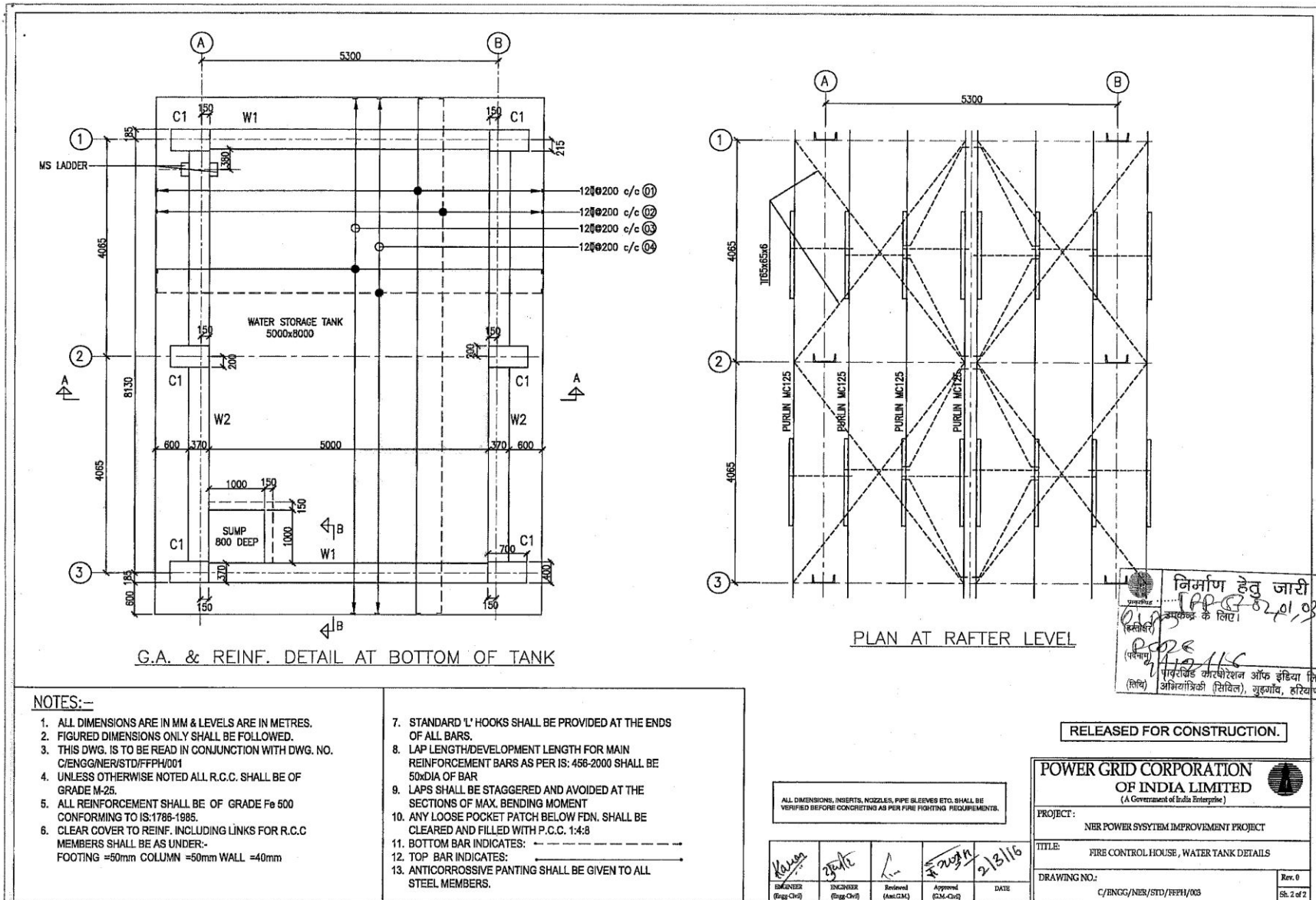
- (1) ALL DIMENSIONS ARE IN MM AND LEVEL IN METERS.
- (2) DO NOT SCALE THE DRG. FOLLOW WRITTEN DIMENSIONS ONLY
- (3) UNLESS OTHERWISE NOTED ALL R.C.C. SHALL BE OF GRADE M-25.
- (4) ALL LEAN CONCRETE SHALL BE 1:4.8 (1 CEMENT ,4 COARSE SAND 8 GRADED STONE AGGREGATE 40 MM NOMINAL SIZE).A SLIDING LAYER OF BITUMEN PAPER OR CRAFT PAPER SHALL BE PROVIDED BETWEEN BASE SLAB
- (5) ALL REINFORCEMENT SHALL BE OF GRADE Fe 500 CONFORMING TO IS:1786-1985.
- (6) CLEAR COVER TO REINFORCEMENT SHALL BE AS UNDER
 - * BOTTOM AND SIDES OF FOUNDATION - 50 MM
 - * FOR COLUMN - 40 MM
 - * FOR BEAMS - 25 MM
 - * FOR LINTELS, CHAJJAS & SLABS - 20 MM
- 7 PROVIDE CLEAR COVER TO REINFORCEMENT FOR WATER TANK AS GIVEN BELOW..
25 mm FOR FACE IN CONTACT WITH WATER
50 mm FOR FACE IN CONTACT WITH SOIL
- 8 ALL LAPS SHALL BE STAGGERED AND LAP LENGTH SHALL BE 50 TIMES THE BAR DIA.
- 9 CONSTRUCTION JOINT BE IN CONSULTATION WITH SITE INCHARGE TO SUIT CONCRETING PROGRAMME/FORM WORK.
- 10 WATER NOT TO BE FILLED IN TANK UNTIL TOP LIFT HAS BEEN CAST & CURED
- 11 INTEGRAL WATER PROOFING COMPOUND SHALL BE ADDED WHILE CONCRETING AS PER Manufacturer's RECOMMENDATIONS
- 12 ALL INSERTS, NOZZLES, PIPE SLEEVES ETC. SHALL BE PLACED IN POSITION BEFORE CONCRETING AS PER FIRE FIGHTING REQUIREMENTS.
- 13 DIMENSIONS OF EQUIPMENT FOUNDATIONS SHALL BE AS PER F.F.SYSTEM REQUIREMENTS.
- 14 PURL INS SHALL BE MANUFACTURED AFTER EXACT MEASUREMENT AT SITE.
- 15 COLOUR SCHEME MATCHING WITH CR BUILDING SHALL BE DECIDED AT SITE
- 16 ALL EXTERNAL WALLS ARE 230 THICK
- 17 WATER PROOFING SHALL BE DONE AS PER SPECIFICATION
- 18 ALL EXTERNAL SURFACES SHALL HAVE 18 MM THK CEMENT PLASTER AS PER SPECIFICATION.
- 19 ALL INTERNAL SURFACES SHALL HAVE 12 MM THK CEMENT PLASTER ON SMOOTH SURFACE OF BRICK WALL & 15mm THK. CEMENT PLASTER ON ROUGH SIDE OF BRICK WALL AS PER SPECIFICATION.
- 20 CEILINGS SHALL HAVE 6MM THK CEMENT PLASTER AS PER SPECIFICATION .
- 21 OUTSIDE AND INSIDE SURFACES OF FIRE WATER TANK SHALL BE UNPLASTERED AND PROVIDED WITH A NEAT COAT OF CEMENT WASH
- 22 FOUNDATION HAS BEEN DESIGNED FOR A BEARING CAPACITY OF 9.0 MT/SQM
- 23 LEVELS OF PLINTH BEAM SHALL BE VERIFIED AS PER CABLE ENTRY DETAILS.





<i>Koush</i>	<i>अज्ञात</i>	<i>...</i>	<i>...</i>	2/3/16
ENGINEER (Engg. Chg)	ENGINEER (Engg. Chg)	Reviewed (Asst. G.M.)	Approved (G.M. Chg)	DATE

POWER GRID CORPORATION OF INDIA LIMITED <small>(A Government of India Enterprise)</small>	
PROJECT : NER POWER SYSTEM IMPROVEMENT PROJECT	
TITLE : FIRE CONTROL HOUSE, GENERAL NOTES	
DRAWING NO. : C/ENGG/NER/STD/FFPH/002	Rev. 0 Sh. 5 of 5




NOTES:-

- ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METRES.
- FIGURED DIMENSIONS ONLY SHALL BE FOLLOWED.
- THIS DWG. IS TO BE READ IN CONJUNCTION WITH DWG. NO. C/ENGG/NER/STD/FFPH/001
- UNLESS OTHERWISE NOTED ALL R.C.C. SHALL BE OF GRADE M-25.
- ALL REINFORCEMENT SHALL BE OF GRADE Fe 500 CONFORMING TO IS:1786-1985.
- CLEAR COVER TO REINF. INCLUDING LINKS FOR R.C.C MEMBERS SHALL BE AS UNDER:-
FOOTING =50mm COLUMN =50mm WALL =40mm
- STANDARD 'L' HOOKS SHALL BE PROVIDED AT THE ENDS OF ALL BARS.
- LAP LENGTH/DEVELOPMENT LENGTH FOR MAIN REINFORCEMENT BARS AS PER IS: 456-2000 SHALL BE 50xDIA OF BAR
- LAPS SHALL BE STAGGERED AND AVOIDED AT THE SECTIONS OF MAX. BENDING MOMENT
- ANY LOOSE POCKET PATCH BELOW FDN. SHALL BE CLEARED AND FILLED WITH P.C.C. 1:4:8
- BOTTOM BAR INDICATES: 
- TOP BAR INDICATES: 
- ANTICORROSSIVE PAINTING SHALL BE GIVEN TO ALL STEEL MEMBERS.

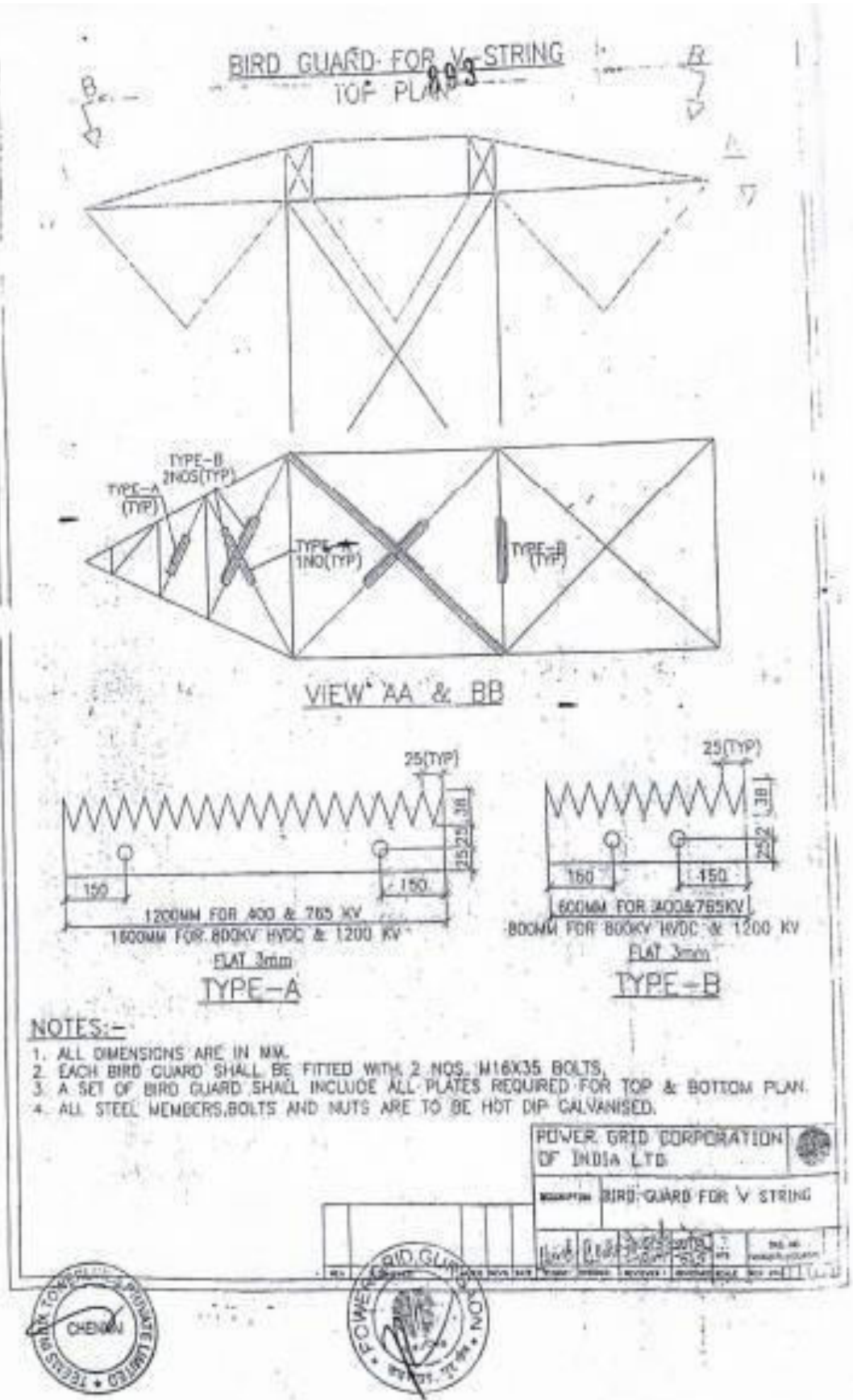


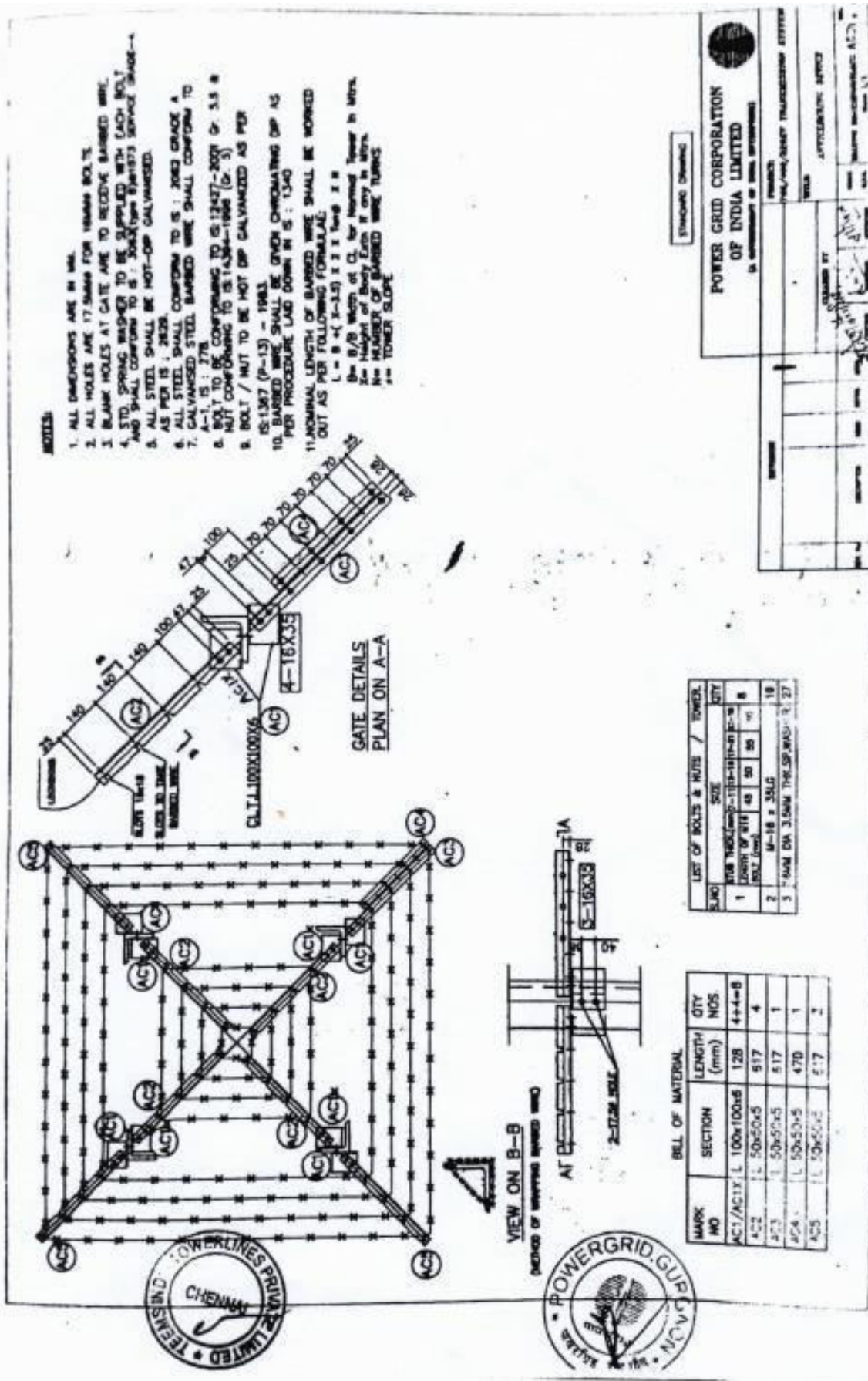
FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



Annexure 14

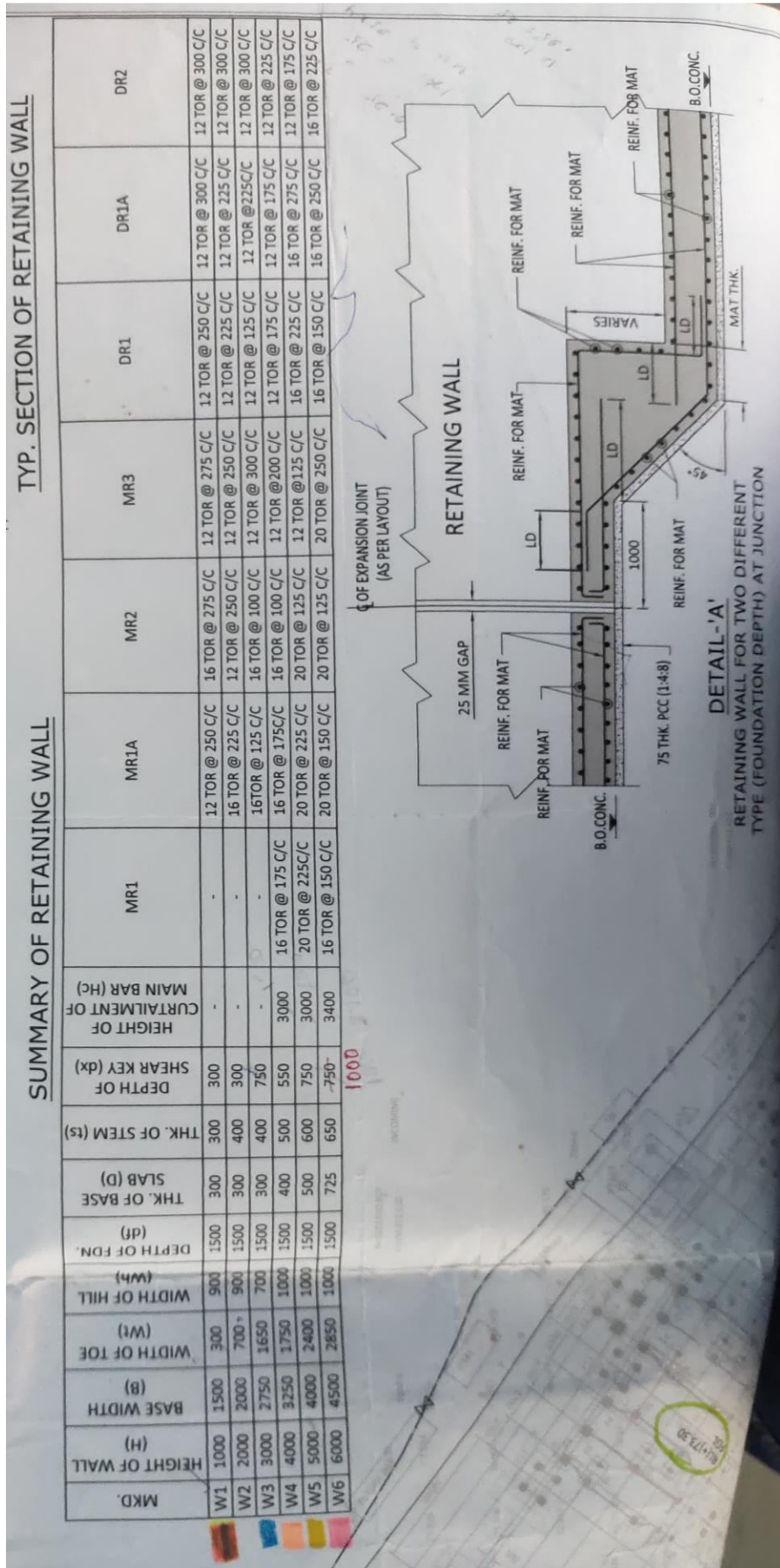
Bird Guard and Anti-Perch Device





Annexure 15

Drawings of RRM Wall / Pretension Wall / Boundary Wall





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POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



Annexure 16

Safety Conditions in Contract Agreement

POWER GRID CORPORATION OF INDIA LTD.**NERPSIP :: AGARTALA**

Ref: NEAGT/NERPSIP-600/2018-19/

Dated: 12.05.2018

**Sub: - Proposal for approval of Safety Plan for Tower Package TW-01, TW-02, TW-03 for
Tripura associated to NERPSIP being awarded to M/s. EMC Limited.**

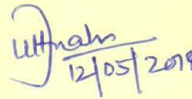
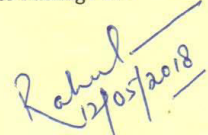
Ref: - CC-CS/86-NER/TW-3612/1/G4/NOA-II/7337 dtd. 12.06.2017

CC-CS/86-NER/TW-3613/1/G4/NOA-II/7339 dtd. 12.06.2017

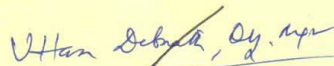
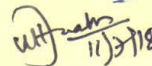
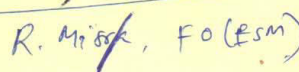
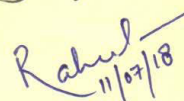
CC-CS/86-NER/TW-3614/1/G4/NOA-II/7341 dtd. 12.06.2017

1. Tower package TW-01, TW-02, TW-03 for Tripura associated to NERPSIP is awarded to M/s. EMC Limited. Under the above said package there are total 08 No. 132kV New Transmission Lines, 03 No. Interconnection portions and 03 No. LILOs with total of 238 km line length. The scope of work also includes 260 km and 171 km OPGW stringing in 14 No. 132kV New and 09 No. 132kV Existing Transmission Lines, respectively.
2. As per the contract agreement Volume B, Section IX. PCC 22.4.3.26, the contractor has to submit the Safety Plan as per Section IX: Contract Forms, Part-3 of bidding document.
3. M/s. EMC Limited vide their letter reference EMC/Tripura/Safety/2018/48 dated 18.01.2018; EMC/Tripura/TW-02/Safety/26; EMC/Tripura/TW03/2017-18/29 dated 04.04.2018 has requested for approval of the Safety Plan to in line with contract agreement guidelines for implementation during the construction of 132kV New Transmission Lines under Tower package TW-01, TW-02, TW-03. The Safety Plan is enclosed for kind perusal.
4. The documents and enclosures submitted by M/s. EMC Limited has been checked and found in order as per requirement of LOA.
5. In view of above it is recommended to approve the Safety Plan for the Tower Package TW-01, TW-02, TW-03 as submitted by M/s. EMC Limited.

Put up for kind approval please.

Dy. Manager (NERPSIP) / Agartala
12/05/2018
(Rahul Misra)
FO (ESM), AgartalaDGM (NERPSIP) / Agartala

Approved as proposed.


Uthman Debbarh, Dy. Mgr
11/07/18
R. Misra, FO (ESM)
11/07/18



अभिभवण पश्चिम बंगाल .WEST BENGAL

22AA 264826

SAFETY PLAN

THIS SAFETY PLAN is made this 7th day of August 2017 by EMC LIMITED, a Company registered under the Companies Act, 1956 concern having its Registered Office at Constantia Office Complex, 11, Dr U N Brahmachari Street, 8th Floor, South Block, Kolkata-700017 (hereinafter called as 'Contractor' which expression shall include its successors and permitted assigns) for approval of M/s Power Grid Corporation of India Limited., a company incorporated under the Companies Act, 1956 having its Registered Office at B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi – 110 016 for its Contract for Tower Package TW-01 associated with NER Power System Improvement Project (Intra-State: Tripura) (Specification No CC-CS/86-NER/TW-3612/1/G4)

WHEREAS POWERGRID has awarded to the Contractor the aforesaid Contract vide its Notification of Award No. CC-CS/86-NER/TW-3612/1/G4/NOA-I/7336 & NOA-II/7337 dated 12.06.2017 for construction of Tower Package : TW-01 associated with NER Power System Improvement Project (Intra-State : Tripura) – Specification NO. CC-CS/86-NER/TW-3612/1/G4 (hereinafter called the "Contract") in terms of which the Contractor is required to submit 'Safety Plan' along with certain documents to the Engineer In-Charge/Project Manager of the POWERGRID within Sixty (60) days of Notification of Award for its approval.

NOW THEREFORE, the Contractor undertakes to execute the Contract as per the safety plan as follows:

1. THAT the Contractor shall execute the works as per provisions of Bidding Documents including those in regard to Safety Precautions / provisions as per statutory requirements.

For EMC Limited.
Rakesh Kumar
Rakesh Kumar
Safety Officer.

For EMC Limited.
Mithu Dutta
Mithu Dutta
(Project Manager)





पश्चिम बंगाल WEST BENGAL

22AA 264827

SAFETY PLAN

THIS SAFETY PLAN is made this 7th day of August 2017 by EMC LIMITED, a Company registered under the Companies Act, 1956 concern having its Registered Office at Constantia Office Complex, 11, Dr U N Brahmachari Street, 8th Floor, South Block, Kolkata-700017 (hereinafter called as 'Contractor' which expression shall include its successors and permitted assigns) for approval of M/s Power Grid Corporation of India Limited., a company incorporated under the Companies Act, 1956 having its Registered Office at B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi – 110 016 for its Contract for Tower Package TW02 associated with NER Power System Improvement Project (Intra-State: Tripura) (Specification No CC-CS/86-NER/TW-3612/1/G4)

WHEREAS POWERGRID has awarded to the Contractor the aforesaid Contract vide its Notification of Award No. CC-CS/86-NER/TW-3613/1/G4/NOA-I/7338 & CA-II/7339 dated 12.06.2017 for Construction of Tower Package : TW-02 associated with NER Power System Improvement Project (Inter-State : Tripura) – Specification No. CC-CS/86-NER/TW-3613/1/G4 (hereinafter called the "Contract") in terms of which the Contractor is required to submit 'Safety Plan' along with certain documents to the Engineer In-Charge/Project Manager of the POWERGRID within Sixty (60) days of Notification of Award for its approval.

NOW THEREFORE, the Contractor undertakes to execute the Contract as per the safety plan as follows:

1. THAT the Contractor shall execute the works as per provisions of Bidding Documents including those in regard to Safety Precautions / provisions as per statutory requirements.





पश्चिमबङ्ग पश्चिम बंगाल WEST BENGAL

22AA 264828

SAFETY PLAN

THIS SAFETY PLAN is made this 7th day of August 2017 by EMC LIMITED, a Company registered under the Companies Act, 1956 concern having its Registered Office at Constantia Office Complex, 11, Dr U N Brahmachari Street, 8th Floor, South Block, Kolkata-700017 (hereinafter called as 'Contractor' which expression shall include its successors and permitted assigns) for approval of M/s Power Grid Corporation of India Limited., a company incorporated under the Companies Act, 1956 having its Registered Office at B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi – 110 016 for its Contract for Tower Package TW03 associated with NER Power System Improvement Project (Intra-State: Tripura) (Specification No CC-CS/86-NER/TW-3612/1/G4)

WHEREAS POWERGRID has awarded to the Contractor the aforesaid Contract vide its Notification of Award No. CC-CS/86-NER/TW-3614/1/G4/NOA-I/7340 & CA-II/7341 dated 12.06.2017 for Construction of Tower Package-TW-03 associated with NER Power System Improvement Project (Inter-State : Tripura – Specification No. CC-CS/86-NER/TW-3614/1/G4 (hereinafter called the "Contract") in terms of which the Contractor is required to submit 'Safety Plan' along with certain documents to the Engineer In-Charge/Project Manager of the POWERGRID within Sixty (60) days of Notification of Award for its approval.

NOW THEREFORE, the Contractor undertakes to execute the Contract as per the safety plan as follows:

1. THAT the Contractor shall execute the works as per provisions of Bidding Documents including those in regard to Safety Precautions / provisions as per statutory requirements.



THE CONTRACTOR shall incorporate modifications/changes in this 'Safety Plan' necessitated on the basis of review/comments of the Engineer In-Charge/Project Manager within fourteen (14) days of receipt of review/comments and on final approval of the Engineer In-Charge/Project Manager of this 'Safety Plan', the Contractor shall execute the works under the Contract as per approved 'Safety Plan'. Further, the Contractor has also noted that the first progressive payment towards Services Contract shall be made on submission of 'Safety Plan' alongwith all requisite documents and approval of the same by the Engineer In-Charge/Project Manager.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.

MD

For and on behalf of
EMC Limited
Name; *Manoj Toshniwal*
Designation : Managing Director

(Common Seal)

WITNESS

1. . Signature

Name :

Address :

2. . Signature

Name :

Address :

✓ *Manoj Toshniwal*
MD

ordered by the Employer consistent with the requirements of the Contract.

PC 21.4 Replace the word 'materials' in line no. 2 with 'Plant and Equipment'.

Add the word 'including liabilities for port charges if any' after the word 'clearance' in line no. 3.

Addition of Sub-Clauses (PC22.2.3.1, PC22.2.3.2, PC22.2.3.3, PC 22.2.3.4) of GC 22.2.3

PC 22.2.3.1 Compliance with Labour Regulations

During continuance of the contract, the Contractor and his sub-contractors shall abide at all times by all applicable existing labour enactments and rules made thereunder, regulations notifications and byelaws of the State or Central Government or local authority and any other labour law (including rules), regulations bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. The employees of the Contractor and the Sub-contractor in no case shall be treated as the employees of the Employer at any point of time.

PC 22.2.3.2 The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules made thereunder, regulations or notifications including amendments.

PC 22.2.3.3 If the Employer is caused to pay under any law as principal employer such amounts as may be necessary to cause or observe, or for non observance of the provisions stipulated in the notifications/ byelaws/Acts/ Rules/regulations including amendments, if any, on the part of the Contractor, the Employer shall have the right to deduct any money due to the Contractor under this contract or any other contract with the employer including his amount of performance security for adjusting the aforesaid payment. The Employer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

PC 22.2.3.4 Salient features of some major laws applicable to establishments engaged in building and other construction works are indicated at **Appendix-I** to PC.

Addition of New Sub-Clauses (PC22.4.1 to 22.4.3 including its sub-clauses) of GC 22.4

PC 22.4.1 **Protection of Environment**

The Contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other

causes arising as consequence of his methods of operation.

During continuance of the Contract, the Contractor and his Sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made there under, regulations, notifications and bye-laws of the State or Central Government, or local authorities and any other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local authority.

Salient features of some of the major laws that are applicable are given below:

The Water (Prevention and Control of Pollution) Act, 1974, This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.

The Air (Prevention and Control of Pollution) Act, 1981, This provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence in the atmosphere of any 'air pollutant', which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

The Environment (Protection) Act, 1986, This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. 'Environment' includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property.

The Public Liability Insurance Act, 1991, This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under Environment (Protection) Act, 1986, and exceeding such quantity as may be specified by notification by the Central Government.

PC 22.4.2

- (i) The Contractor shall (a) establish an operational system of managing environmental impacts, (b) carry out all the monitoring and mitigation measures set forth in the environment management plan attached to the Particular Conditions as Appendix-I, and (c) allocate the budget required

to ensure that such measures are carried out. The Contractor shall submit to the Employer (quarterly) semi-annual) reports on the carrying out of such measures.

- (ii) The Contractor shall adequately record the conditions of roads, agricultural land and other infrastructure prior to transport of material and construction commencement, and shall fully reinstate pathways, other local infrastructure and agricultural land to atleast their pre-project condition upon construction completion.
- (iii) The Contractor shall undertake detailed survey of the affected persons during transmission line alignment finalization under the Project, where applicable. and
- (iv) The Contractor shall conduct health and safety programme for workers employed under the Contract and shall include information on the risk of sexually transmitted diseases, including HIV/AIDS in such programs.

PC 22.4.3 Safety Precautions

PC 22.4.3.1 The Contractor shall observe all applicable regulations regarding safety on the Site.

Unless, otherwise agreed, the Contractor shall, from the commencement of work on Site until taking over, provide:

- a) fencing, lighting, guarding and watching of the Works wherever required, and
- b) temporary roadways, footways, guards and fences which may be necessary for the accommodation and protection of Employer / his representatives and occupiers of adjacent property, the public and others.

PC 22.4.3.2 The Contractor shall ensure proper safety of all the workmen, materials, plant and equipment belonging to him or to THE EMPLOYER or to others, working at the Site. The Contractor shall also be responsible for provision of all safety notices and safety equipment required both by the relevant legislations and the Engineer, as he may deem necessary.

PC 22.4.3.3 The Contractor will notify well in advance to the Engineer of his intention to bring to the Site any container filled with liquid or gaseous fuel or explosive or petroleum substance or such chemicals which may involve hazards. The Engineer shall have the right to prescribe the conditions, under which such container is to be stored, handled and used during the performance of the works and the Contractor shall strictly adhere to and comply with such

instructions. The Engineer shall have the right at his sole discretion to inspect any such container or such construction, plant/equipment for which material in the container is required to be used and if in his opinion, its use is not safe, he may forbid its use. No claim due to such prohibition shall be entertained by the Owner and the Owner shall not entertain any claim of the Contractor towards additional safety provisions/conditions to be provided for/constructed as per the Engineer's instructions.

Further, any such decision of the Engineer shall not, in any way, absolve the Contractor of his responsibilities and in case, use of such a container or entry thereof into the Site area is forbidden by the Engineer, the Contractor shall use alternative methods with the approval of the Engineer without any cost implication to THE EMPLOYER or extension of work schedule.

- PC 22.4.3.4 Where it is necessary to provide and/or store petroleum products or petroleum mixtures and explosives, the Contractor shall be responsible for carrying-out such provision and/or storage in accordance with the rules and regulations laid down in Petroleum Act 1934, Explosives Act, 1948 and Petroleum and Carbide of Calcium Manual published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the Engineer. In case, any approvals are necessary from the Chief Inspector (Explosives) or any statutory authorities, the Contractor shall be responsible for obtaining the same.
- PC 22.4.3.5 All equipment used in construction and erection by Contractor shall meet Indian/International Standards and where such standards do not exist, the Contractor shall ensure these to be absolutely safe. All equipment shall be strictly operated and maintained by the Contractor in accordance with manufacturer's Operation Manual and safety instructions and as per Guidelines/rules of THE EMPLOYER in this regard.
- PC 22.4.3.6 Periodical examinations and all tests for all lifting/hoisting equipment & tackles shall be carried-out in accordance with the relevant provisions of Factories Act 1948, Indian Electricity Act, 1910 and associated Laws/Rules in force from time to time. A register of such examinations and tests shall be properly maintained by the Contractor and will be promptly produced as and when desired by the Engineer or by the person authorised by him.
- PC 22.4.3.7 The Contractor shall be fully responsible for the safe storage of his and his Sub-Contractor's radioactive sources in accordance with BARC/DAE Rules and other applicable provisions. All precautionary measures stipulated by

- BARC/DAE in connection with use, storage and handling of such material will be taken by the Contractor.
- PC 22.4.3.8 The Contractor shall provide suitable safety equipment of prescribed standard to all employees and workmen according to the need, as may be directed by the Engineer who will also have right to examine these safety equipment to determine their suitability, reliability, acceptability and adaptability.
- PC 22.4.3.9 Where explosives are to be used, the same shall be used under the direct control and supervision of an expert, experienced, qualified and competent person strictly in accordance with the Code of Practice/Rules framed under Indian Explosives Act pertaining to handling, storage and use of explosives.
- PC 22.4.3.10 The Contractor shall provide safe working conditions to all workmen and employees at the Site including safe means of access, railings, stairs, ladders, scaffoldings etc. The scaffoldings shall be erected under the control and supervision of an experienced and competent person. For erection, good and standard quality of material only shall be used by the Contractor.
- PC 22.4.3.11 The Contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to the Owner or other Contractors under any circumstances, whatsoever, unless expressly permitted in writing by THE EMPLOYER to handle such fuses, wiring, or electrical equipment
- PC 22.4.3.12 Before the Contractor connects any electrical appliances to any plug or socket belonging to the other Contractor or Owner, he shall:
- Satisfy the Engineer that the appliance is in good working condition;
 - Inform the Engineer of the maximum current rating, voltage and phases of the appliances;
 - Obtain permission of the Engineer detailing the sockets to which the appliances may be connected.
- PC 22.4.3.13 The Engineer will not grant permission to connect until he is satisfied that:
- The appliance is in good condition and is fitted with suitable plug;
 - The appliance is fitted with a suitable cable having two earth conductors, one of which shall be an

earthed metal sheath surrounding the cores.

- PC 22.4.3.14 No electric cable in use by the Contractor/Owner will be disturbed without prior permission. No weight of any description will be imposed on any cable and no ladder or similar equipment will rest against or attached to it.
- PC 22.4.3.15 No repair work shall be carried out on any live equipment. The equipment must be declared safe by the Engineer and a permit to work shall be issued by the Engineer before any repair work is carried out by the Contractor. While working on electric lines/equipment, whether live or dead, suitable type and sufficient quantity of tools will have to be provided by the Contractor to electricians/workmen/officers.
- PC 22.4.3.16 The Contractors shall employ necessary number of qualified, full time electricians/electrical supervisors to maintain his temporary electrical installation.
- PC 22.4.3.17 The Contractor employing more than 250 workmen whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as safety officer to supervise safety aspects of the equipment and workmen, who will coordinate with the Project Safety Officer. In case of work being carried out through Sub-Contractors, the Sub-Contractor's workmen/employees will also be considered as the Contractor's employees/workmen for the above purpose.
- The name and address of such Safety Officers of the Contractor will be promptly informed in writing to Engineer with a copy to Safety Officer-In charge before he starts work or immediately after any change of the incumbent is made during currency of the Contract.
- PC 22.4.3.18 In case any accident occurs during the construction/ erection or other associated activities undertaken by the Contractor thereby causing any minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be the responsibility of the Contractor to promptly inform the same to the Engineer in prescribed form and also to all the authorities envisaged under the applicable laws.
- PC 22.4.3.19 The Engineer shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipment. In such cases, the Contractor shall be informed in writing about the nature of hazards and

possible injury/accident and he shall comply to remove shortcomings promptly. The Contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of work to the Engineer within 3 days of such stoppage of work and decision of the Engineer in this respect shall be conclusive and binding on the Contractor.

PC 22.4.3.20 The Contractor shall not be entitled for any damages/compensation for stoppage of work due to safety reasons as provided in para GCC 22.4.3.19 above and the period of such stoppage of work will not be taken as an extension of time for completion of work and will not be the ground for waiver of levy of liquidated damages.

PC 22.4.3.21 It is mandatory for the Contractor to observe during the execution of the works: requirements of Safety Rules which would generally include but not limited to following:

Safety Rules.

- a) Each employee shall be provided with initial indoctrination regarding safety by the Contractor, so as to enable him to conduct his work in a safe manner.
- b) No employee shall be given a new assignment of work unfamiliar to him without proper introduction as to the hazards incident thereto, both to himself and his fellow employees.
- c) Under no circumstances shall an employee hurry or take unnecessary chance when working under hazardous conditions.
- d) Employees must not leave naked fires unattended. Smoking shall not be permitted around fire prone areas and adequate fire fighting equipment shall be provided at crucial location.
- e) Employees under the influence of any intoxicating beverage, even to the slightest degree shall not be permitted to remain at work.
- f) There shall be a suitable arrangement at every work site for rendering prompt and sufficient first aid to the injured.
- g) The staircases and passageways shall be adequately lighted.
- h) The employees when working around moving machinery, must not be permitted to wear loose

EMPLOYER employees or any other person who are at Site or adjacent thereto, then the Contractor shall be responsible for payment of a sum as indicated below to be deposited with THE EMPLOYER, which will be passed on by THE EMPLOYER to such person or next to kith and kin of the deceased:

a.	Fatal injury or accident causing death	Rs. 1,000,000/- per person
b.	Major injuries or accident causing 25% or more permanent disablement	Rs. 100,000/- per person

Permanent disablement shall have same meaning as indicated in Workmen's Compensation Act. The amount to be deposited with THE EMPLOYER and passed on to the person mentioned above shall be in addition to the compensation payable under the relevant provisions of the Workmen's Compensation Act and rules framed there under or any other applicable laws as applicable from time to time. In case the Contractor does not deposit the above mentioned amount with THE EMPLOYER, such amount shall be recovered by THE EMPLOYER from any monies due or becoming due to the Contractor under the contract or any other on-going contract.

PC22.4.3.25 If the Contractor observes all the Safety Rules and Codes, Statutory Laws and Rules during the currency of Contract awarded by the Owner and no accident occurs then THE EMPLOYER may consider the performance of the Contractor and award suitable 'ACCIDENT FREE SAFETY MERITORIOUS AWARD' as per scheme as may be announced separately from time to time.

PC22.4.3.26 The Contractor shall also submit 'Safety Plan' as per proforma specified in Section IX: Contract Forms, Part-3 of Bidding Documents alongwith all the requisite documents mentioned therein and as per check-list contained therein to the Engineer In-Charge for its approval within 60 days of award of Contract.

Further, one of the conditions for release of first progressive payment / subsequent payment towards Services Contract shall be submission of 'Safety Plan' alongwith all requisite documents and approval of the same by the Engineer In-Charge.

PC 22.6 Emergency Work (GC Clause 22.6)

Replace the words "Otherwise" with "In case such work is not in the scope of the Contractor", in the second last line of second paragraph of GC clause 22.6.

PC 23.3 Supplementing sub-clause GC 23.3

For notification of testing, four weeks shall be deemed as reasonable advance notice.

PC 23.7 Test and Inspection (GC Clause 23.7)

Replace the words "GC Sub-Clause 6.1" with "GC Sub-Clause 46.1", in the last line of GC clause 23.7.

PC 24 Replace the marginal words/headings 'Completion of the Facilities' with 'Pre Commissioning'**PC 24.5 Replace sub clause GC 24.5 with the following:**

The Project Manager shall, within fourteen (14) days after receipt of the Contractor's notice under sub clause GC 24.4, notify the Contractor in writing of any defects and/or deficiencies.

If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in sub clause GC 24.4. If the Project Manager is satisfied that the Facilities or that part thereof have passed Pre-commissioning, the Project Manager shall, within fourteen (14) days after receipt of the Contractor's notice/ seven (7) days after receipt of the Contractor's repeated notice, advise the Contractor to proceed with the Commissioning of the Facilities or that part thereof. If the Project Manager is not so satisfied, then it shall notify the Contractor in writing of any defects and/or deficiencies within seven (7) days after receipt of the Contractor's repeated notice, and the above procedure shall be repeated.

PC 24.6 Replacing Sub-Clause GC 24.6

If the Project Manager fails to advise the Contractor to proceed with the Commissioning of the Facilities or the relevant part thereof or inform the Contractor of any defects and/or deficiencies within fourteen (14) days after receipt of the Contractor's notice under GC Sub-Clause 24.4 or within seven (7) days after receipt of the Contractor's repeated notice under GC Sub-Clause 24.5, then the Facilities or that part thereof shall be deemed to have passed Precommissioning, as of the date of the Contractor's notice or repeated notice, as the case may be.

PC 24.7 Replace the word 'Completion' with 'Pre-commissioning' in the 1st line of sub clause GC 24.7



FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



Annexure 17

Safety Plan



SAFETY PLAN

13. FORM OF SAFETY PLAN TO BE SUBMITTED BY THE CONTRACTOR WITHIN SIXTY DAYS OF AWARD OF CONTRACT

[TO BE EXECUTED ON A NON JUDICIAL STAMP PAPER WORTH RS. TWENTY ONLY]

SAFETY PLAN

THIS SAFETY PLAN is made this..... day of 20..... by a Company registered under the Companies Act, 1956/Partnership firm/proprietary concern having its Registered Office at[to be modified suitably for JV Contractor] (hereinafter called as 'Contractor' which expression shall include its successors and permitted assigns) for approval of(insert name of the Employer)....., a company incorporated under the Companies Act, 1956 having its Registered Office at (Insert registered address of the Employer)..... for its Contract for (Insert package name, project name along with Specification number of the Contract)..... WHEREAS..... (Abbreviated name of the Employer)..... has awarded to the Contractor the aforesaid Contract vide its Notification of Award/Contract No. datedand Amendment No. (Applicable when amendments have been issued(hereinafter called the "Contract")) in terms of which the Contractor is required to submit 'Safety Plan' along with certain documents to the Engineer In-Charge/Project Manager of the Employer within Sixty (60) days of Notification of Award for its approval.

NOW THEREFORE, the Contractor undertakes to execute the Contract as per the safety plan as follows:

1. THAT the Contractor shall execute the works as per provisions of Bidding Documents including those in regard to Safety Precautions / provisions as per statutory requirements.
2. THAT the Contractor shall execute the works in a well-planned manner from the commencement of Contract as per agreed mile stones of work completion schedule so that planning and execution of construction works goes smoothly and consistently throughout the contract duration without handling pressure in last quarter of the financial year/last months of the Contract and the shall be finalized in association with EMPLOYER Engineer In-charge/Project Manager from time to time as required.
3. THAT the Contractor has prepared the safe work procedure for each activity i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. to be executed at site, which is

enclosed at **Annexure - 1A (SP)** for acceptance and approval of Engineer In-charge/Project Manager. The Contractor shall ensure that on approval of the same from Engineer In-charge/Project Manager , the approved copies will be circulated to Employer's personnel at site [Supervisor(s)/Executive(s)] and Contractor's personnel at site [Gang leader, supervisor(s) etc.] in their local language / language understood by gang.

4. THAT the Contractor has prepared minimum manpower deployment plan, activity wise as stated above, which is enclosed at **Annexure - 1B (SP)** for approval of Engineer In-charge/Project Manager.

5. THAT the Contractor shall ensure while executing works that they will deploy minimum 25% of their own experienced work force who are on the permanent roll of the company and balance 75% can be a suitable mixed with the hired gangs / local workers / casual workers if required. The above balance 75% work force should be provided with at least 10 days training by the construction agencies at sites and shall be issued with a certificate. No worker shall be engaged without a valid certificate. Hired gang workers shall also follow safe working procedures and safety norms as is being followed by company's workmen. It should also be ensured by the contractor that certified fitters who are climbing towers / doing stringing operations can be easily identifiable with a system like issue of Badge / Identification cards (ID cards) etc. Color identification batches should be worn by the workers. Contractor has to ensure that inexperience workers / unskilled workers should not be deployed for skilled job.

6. THAT the Contractor's Gang leader / Supervisor / Senior most member available at every construction site shall brief to each worker daily before start of work about safety requirement and warn about imminent dangers and precautions to be taken against the imminent dangers (Daily Safety Drill). This is to be ensured without fail by Contractor and maintain record of each gang about daily safety instructions issued to workers and put up to EMPLOYER site In-charge for his review and record.

7. THAT the Contractor shall ensure that working Gangs at site should not be left at the discretion of their Gang Leaders who are generally hired and having little knowledge about safety. Gang leader should be experienced and well versed with the safe working procedures applicable for transmission line/ Sub Station works. In case gang is having Gang leader not on permanent roll of the company then additional Supervisor from company's own roll having thorough knowledge about the works would be deployed so as to percolate safety instructions up to the grass root level in healthy spirits. Contractor has to ensure close supervision while executing critical locations of transmission lines / sub stations and ensures that all safety instructions are in place and are being followed.

8. THAT the Contractor shall maintain in healthy and working condition all kind of Equipments / Machineries / Lifting tools / Lifting tackles / Lifting gears / All kind of Ropes including wire ropes / Polypropylene ropes etc. used for Lifting purpose during

execution of the project and get them periodically examined and load tested for safe working load in accordance with relevant provisions and requirement of Building & other construction workers Regulation of Employment and Conditions of Services Act and Central Rule 1998, Factories Act 1948, Indian Electricity Act 2003 before start of the project. A register of such examinations and tests shall be properly maintained by the contractor and will be promptly produced as and when desired by the Engineer In-charge/Project Manager or by the person authorised by him. The Contractor has to ensure to give special attention on the formation / condition of eye splices of wire rope slings as per requirement of IS 2762 Specification for wire rope slings and sling legs.

9. THAT the Contractor has prepared a list of all Lifting machines, lifting Tools / Lifting Tackles / Lifting Gears etc. / All types of ropes and Slings which are subject to safe working load is **enclosed at Annexure - 2 (SP)** for review and approval of Engineer In-charge/Project Manager.

10. THAT the Contractor has to procure sufficient quantity of Personal Protective Equipment (PPE) conforming to Indian / International standards and provide these equipment to every workman at site as per need and to the satisfaction of Engineer-in-charge/Project Manager of EMPLOYER. The Contractor's Site Supervisor/ Project Manager has to ensure that all workmen must use Personal Protective Equipment at site. The Contractor shall also ensure that Industrial Safety helmets are being used by all workmen at site irrespective of their working (at height or on ground). The Contractor shall further ensure use of safety shoes by all ground level workers and canvas shoes for all workers working at height, Rubber Gum Boots for workers working in rainy season and concreting job, Use of Twin Lanyard Full body Safety Harness with attachment of light weight such as aluminum alloy etc. and having features of automatic locking arrangement of snap hook, by all workers working at height for more than three meters and also for horizontal movement on tower shall be ensured by contractor. The Contractor shall not use ordinary half body safety harness at site. The Contractor has to ensure use of Retractable type fall arrestors by workers for ascending / descending on suspension insulator string and other similar works etc., Use of Mobile fall arrestor for ascending / descending from tower by all workers. The contractor has to provide cotton / leather hand gloves as per requirement, Electrical Resistance Hand gloves for operating electrical installations / switches, Face shield for protecting eyes while doing welding works and Dust masks to workers as per requirement. The Contractor will have to take action against the workers not using Personal Protective Equipment at site and those workers shall be asked to rest for that day and also their Salary be deducted for that day. EMPLOYER may issue warning letter to Project Manager of contractor in violation of above norms.

11. THAT the Contractor shall prepare a detailed list of PPEs, activity wise, to commensurate with manpower deployed, which is enclosed at **Annexure - 3 (SP)** for

review and approval of Engineer In-charge/Project Manager. It shall also be ensured that the sample of these equipment shall be got approved from EMPLOYER supervisory staff before being distributed to workers. The contractor shall submit relevant test certificates as per IS / International Standard as applicable to PPEs used during execution of work. All the PPE's to be distributed to the workers shall be checked by EMPLOYER supervisory staff before its usage.

12. The Contractor also agrees for addition / modification to the list of PPE, if any, as advised by Engineer In-Charge/Project Manager.

13. THAT the Contractor shall procure, if required sufficient quantity of Earthing Equipment / Earthing Devices complying with requirements of relevant IEC standards (Generally IECs standards for Earthing Equipments / Earthing Devices are – 855, 1230, 1235 etc.) and to the satisfaction of Engineer In-Charge/ Project Manager and contractor to ensures to maintained them in healthy condition.

14. THAT the Contractor has prepared / worked out minimum number of healthy Earthing Equipments with Earthing lead confirming to relevant IS / European standards per gang wise during stringing activity/as per requirement, which is enclosed herewith at **Annexure – 4** (SP) for review and acceptance of Engineer In-Charge/ Project Manager prior to execution of work.

15. THAT the Contractor shall provide communication facilities i.e. Walky – Talkie / Mobile Phone, Display of Flags / whistles for easy communication among workers during Tower erection / stringing activity, as per requirement.

16. THAT the Contractor undertakes to deploy qualified safety personnel responsible for safety as per requirements of Employer/Statutory Authorities.

17. THAT the Contractor employing more than 250 workmen whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as qualified safety officer having diploma in safety to supervise safety aspects of the equipment and workmen who will coordinate with Engineer In-charge /Project Manager/Safety Coordinator of the Employer. In case of work being carried out through sub-contractors the sub – contractor's workmen / employees will also be considered as the contractor's employees / workmen for the above purpose. If the number of workers are less than 250 then one qualified safety officer is to be deployed for each contract. He will report directly to his head of organization and not the Project Manager of contractor He shall also not be assigned any other work except assigning the work of safety. The curriculum vitae of such person shall be got cleared from EMPLOYER Project Manager / Construction staff.

18. The name and address of such safety officers of contractor will be promptly informed in writing to Engineer In-charge with a copy to safety officer - In-charge before start of work or immediately after any change of the incumbent is made during the

currency of the contract. The list is enclosed at **Annexure – 5A (SP)**.

19. THAT the Contractor has also prepared a list including details of Explosive Operator (if required), Safety officer / Safety supervisor / nominated person for safety for each erection

20. / stringing gang, list of personnel trained in First Aid Techniques as well as copy of organization structure of the Contractor in regard to safety. The list is enclosed at **Annexure – 5B (SP)**.

21. The Project Manager shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipment. In such cases, the Contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove shortcomings promptly. The Contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of work to the Project Manager within 3 days of such stoppage of work and decision of the Project Manager in this respect shall be conclusive and binding on the Contractor.

22. THAT, if, any Employer's Engineer/ supervisor at site observes that the Contractor is failing to provide safe working environment at site as per agreed Safety Plan / EMPLOYER Safety Rule/ Safety Instructions / Statutory safety requirement and creates hazardous conditions at site and there is possibility of an accident to workmen or workmen of the other contractor or public or the work is being carried out in an un safe manner or he continues to work even after being instructed to stop the work by Engineer / Supervisor at site / RHQ / Corp. Centre, the Contractor shall be bound to pay a penalty of Rs. 10,000/- per incident per day till the instructions are complied and as certified by Engineer/ Supervisor of Employer at site. The work will remain suspended and no activity will take place without compliance and obtaining clearance / certification of the Site Engineer / Supervisor of the Employer to start the work.

23. THAT, if the investigation committee of Employer observes any accident or the Engineer In-charge/Project Manager of the Employer based on the report of the Engineer/Supervisor of the Employer at site observes any failure on the Contractor's part to comply with safety requirement / safety rules/ safety standards/ safety instruction as prescribed by the Employer or as prescribed under the applicable law for the safety of the equipment, plant and personnel and the Contractor does not take adequate steps to prevent hazardous conditions which may cause injury to its own Contractor's employees or employee of any other Contractors or Employer or any other person at site or adjacent thereto, or public involvement because of the Contractor's negligence of safety norms, the Contractor shall be liable to pay a compensation of Rs. 10,00,000/- (Rupees Ten Lakh only) per person affected causing death and Rs. 1,00,000/- (Rupees One Lakh only) per person for serious injuries / 25% or more permanent disability to the Employer for further disbursement to the deceased family/ Injured persons. The permanent disability

has the same meaning as indicated in Workmen's Compensation Act 1923. The above stipulations is in addition to all other compensation payable to sufferer as per workmen compensation Act / Rules

24. THAT as per the Employer's instructions, the Contractor agrees that this amount shall be deducted from their running bill(s) immediately after the accident, That the Contractor understands that this amount shall be over and above the compensation amount liable to be paid as per the Workmen's Compensation Act /other statutory requirement/ provisions of the Bidding Documents.

25. THAT the Contractor shall submit Near-Miss-Accident report along with action plan for avoidance such incidence /accidents to Engineer – In-charge/ Project Manager. Contractor shall also submit Monthly Safety Activities report to Engineer – In-charge/ Project Manager and copy of the Monthly Safety Activities report also to be sent to Safety In-charge at RHQ of the Employer for his review record and instructions.

26. THAT the Contractor is submitting a copy of Safety Policy/ Safety Documents of its Company which is enclosed at Annexure – 6 (SP) and ensure that the safety Policy and safety documents are implemented in healthy spirit.

27. THAT the Contractor shall make available of First Aid Box [Contents of which shall be as per Building & other construction workers (Regulation of Employment and Conditions of Services Act and Central Rule 1998 / EMPLOYER Guidelines)] to the satisfaction of Engineer In-Charge/ Project Manager with each gang at site and not at camp and ensures that trained persons in First Aid Techniques with each gang before execution of work.

28. THAT the Contractor shall submit an 'Emergency Preparedness Plan' for different incidences i.e. Fall from height, Electrocution, Sun Stroke, Collapse of pit, Collapse of Tower, Snake bite, Fire in camp / Store, Flood, Storm, Earthquake, Militancy etc. while carrying out different activities under execution i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. which is enclosed at Annexure – 7 (SP) for approval of the Engineer In-Charge/ Project Manager before start of work.

29. THAT the Contractor shall organize Safety Training Programs on Safety, Health and Environment and for safe execution of different activities of works i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. . For their own employees including sub-contractor workers on regular basis.

30. The Contractor, therefore, submits copy of the module of training program, enclosed at **Annexure – 9 (SP)**, to Engineer In-charge/Project Manager for its acceptance and approval and records maintained.

31. THAT the Contractor shall conduct safety audit, as per Safety Audit Check Lists

enclosed at **Annexure – 8 (SP)**, by his Safety Officer(s) every month during construction of Transmission Lines / Sub Stations / any other work and copy of the safety audit report will be forwarded to the Employer's Engineer In-charge / Site In-charge/Project Manager for his comments and feedback. During safety audit, healthiness of all Personal Protective Equipments (PPEs) shall be checked individually by safety officer of contractor and issue a certificate of its healthiness or rejection of faulty PPEs and contractor has to ensure that all faulty PPEs and all faulty lifting tools and tackles should be destroyed in the presence of EMPLOYER construction staff. Contractor has to ensure that each gang be safety audited at least once in two months. During safety audit by the contractor, Safety officer's feedback from EMPLOYER concerned shall be taken and recorded. The Employer's site officials shall also conduct safety audit at their own from time to time when construction activities are under progress. Apart from above, the Employer may also conduct surveillance safety audits. The Employer may take action against the person / persons as deemed fit under various statutory acts/provisions under the Contract for any violation of safety norms / safety standards.

32. THAT the Contractor shall develop and display Safety Posters of construction activity at site and also at camp where workers are generally residing.

33. THAT the Contractor shall ensure to provide potable and safe drinking water for workers at site / at camp.

34. THAT the Contractor shall do health check up of all workers from competent agencies and reports will be submitted to Engineer In-Charge within fifteen (15) days of health check up of workers as per statutory requirement.

35. THAT the Contractor shall submit information along with documentary evidences in regard to compliance to various statutory requirements as applicable which are enclosed at **Annexure – 10A (SP)**.

36. The Contractor shall also submit details of Insurance Policies taken by the Contractor for insurance coverage against accident for all employees are enclosed at Annexure – 10B (SP).

37. THAT a check-list in respect of aforesaid enclosures along with the Contractor's remarks, wherever required, is attached as Annexure – Check List herewith.

38. THE CONTRACTOR shall incorporate modifications/changes in this 'Safety Plan' necessitated on the basis of review/comments of the Engineer In-Charge/Project Manager within fourteen

39. (14) Days of receipt of review/comments and on final approval of the Engineer In-Charge/Project Manager of this 'Safety Plan', the Contractor shall execute the works under the Contract as per approved 'Safety Plan'. Further, the Contractor has also noted that the first progressive payment towards Services Contract shall be made on submission of 'Safety Plan' along with all requisite documents and approval of the same

by the Engineer In-Charge/Project Manager.

40. IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorized representative under the common seal of the Company, the day, month and year first above mentioned.

For and on behalf of

M/s.....

WITNESS

1.

Signature.....

Signature.....

Name.....

Name.....

2.

Signature.....

Authorized representative

Name.....

(Common Seal)

Address.....

(In case of Company)

Note:

All the annexure referred to in this “Safety Plan“are required to be enclosed by the contractor as per the attached “Check List “

Safety Plan is to be executed by the authorized person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute such contract documents etc., (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to this Safety Plan.

For all safety monitoring/ documentation, Engineer In-charge / Regional In-charge of safety at RHQ will be the nodal Officers for communication.



पावरग्रिड
POWERGRID


FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



Annexure 18

Sample Labor License

M/s EMC


GOVERNMENT OF INDIA
MINISTRY OF LABOUR & EMPLOYMENT
OFFICE OF THE ASSISTANT LABOUR COMMISSIONER (CENTRAL)
KENDRIYA SADAN
CHIRUKANDI ROAD, RAMNAGAR, TARAPUR, SILCHAR-788 003, ASSAM
E-mail alc.sil-as@gov.in
TELEPHONE NO. 03842-268330

File / Online Licence No. CLRA/ALC SILCHER/2019/L-176

Dated - 08-09-2020

To

M/s EMC LIMITED
POWER GRID CORPORATION OF INDIA LIMITED CONTRACTOR
51, CANAL EAST ROAD, BELIAGHATA
KOLKATA-700085
REPRESENTED THROUGH: - SHRI MANOJ TOSHNIWAL, DIRECTOR
E. mail - pnair@emcpower.com / Mobile No. 09163317444.

Subject: Contract Labour (Regulation and Abolition) Act, 1970 and its Central Rules, 1971 -
Renewal of Licence No. CLRA/ALCSILCHER/2019/L-176 dated-22.07.2019.

Dear Sir,

Please refer to your Application No. Nil dated-21.07.2020 (received at this office on
21.07.2020) for Renewal of Licence along with Rs. 100/- (Rupees ONE HUNDRED) only deposited
through online towards Renewal fee of the above noted Licence.

In this connection, please find enclosed herewith the original Licence duly
RENEWED UP TO 21. 07. 2021 under the provision of Section-13 (3) of the Contract
Labour (Regulation and Abolition) Act, 1970 read with Rule-29 of its Central Rules, 1971.

Please acknowledge the receipt of the same.

Encl: 1 (Original) Licence.



Yours faithfully,

(CHIRANJEEV SAIKIA)
Regional Labour Commissioner (Central)
DIBRUGARH

And Additional Charge of Assistant Labour Commissioner (Central)
Government of India
Chiranjeev Saikia
SILCHAR Regional Labour Commissioner (C)

Copy forwarded to:
(1) The Labour Enforcement Officer (Central), AGARTALA. A copy of the Form-II is enclosed under the C.L. (Reg. & Abol.) Act, 1970
(2) The Deputy General Manager (NERPSIP), Power Grid Corporation of India Limited, House of Shri Utpal Dutta (Ground Floor), Ramanagar Road No.6, 3rd Crossing, Agartala-799002, Tripura (West) for information.

Regional Labour Commissioner (Central)
DIBRUGARH
And Additional Charge of Assistant Labour Commissioner (Central)
Government of India
SILCHAR



Form VI

(Under Rule 25(1) of the Contract Labour (Regulation and Abolition) Central Rules, 1971)

Government of India
Office of the Licensing Officer

LICENCE

Licence No: **CLRA/ALCSILCHER/2019/L-176**

Date: **22-Jul-2019**

1. Licence is hereby granted to **M/s EMC LIMITED, 51, CANAL EAST ROAD, BELIAGHATA, Kolkata - 700085**, through **MANOJ TOSHNIWAL / DIRECTOR** under sub-section (1) of section 12 of the Contract Labour (Regulation and Abolition) Act, 1970 (37 of 1970) subject to the conditions specified in the Annexure.
2. Name and Location of work **Tower Package TW02 associated with NER Power System Improvement Project (Intra-State: Tripura) vide Contract Agreement No. CC-CS/86-NER/TW-3613/1/G4/CA-I/7338 DATED- 30.06.2017 & No. CC-CS/86-NER/TW-3613/1/G4/CA-II/7339 dated. 30.06.2017**, for **ROKHIA , BELONIA , SABROOM , GOKULNAGAR , SATCHAND, 78, NEW TOWN ROAD, RADHA KRISHNAPUR, UDAIPUR, South Tripura, Tripura - 799120**
3. Name of the principal employer **S.I.SINGH / DY.GENERAL MANAGER, NERPSIP OFFICE, RAMNAGAR-06, 3RD CROSSING, AGARTALA, West Tripura, Tripura - 799002**
4. Registration Certificate no. **A-REG 07/2010-S/A** and date of **22-Jun-2010** of the principal employer.
5. The licence shall remain in force till **21-Jul-2020** (date to be indicated).
6. Maximum number of contract labour to be employed on a single day under the licence: **100**
7. Fee Paid Rs **INR 75** (Transaction Id : **1907190005078**)
8. Security Deposit **INR 9000** (Transaction Id : **1907190005189**)
9. Remarks by Licencing Officer: **Licence is granted**

Licensing Officer.

10. A copy of the licence shall be displayed prominently at the premises where the contract work is being carried on.
11. The contractor shall comply with all the provisions of the Act and these Rules.
12. The licensee shall, within fifteen days of the commencement and completion of each contract work, submit a return to the Inspector appointed under section 28 of the Contract Labour (Regulation and Abolition) Act, 1970 (37 of 1970) intimating the actual date of the commencement or, as the case may be, completion of such contract work in Form - VII.

eSign/DSC of Licensing Officer

Hari Om Gautam (ALC(C))

ALC SILCHER (ALCSILCHER)

alc.ghy-as@gov.in

Note: This is an online application summary applied on Shram Suvidha Portal.

Validity unknown

Digitally signed by User
Date: 2019.07.22 14:57:24 IST



FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



The Oriental Insurance Company Ltd.
CBU KOLKATA 7 RED CROSS PLACE, KOLKATA, WEST BENGAL, 700001
GST NO : 19AAACT0627R3ZU
RECEIPT

Office Code & Name : 311800 - CBU Kolkata
Collection No. : 51-01/4019000228
Collection Date : 10/05/2021 16:08
Bank Code : 9100(C-311800-01)
Posted Doc No. : 4019000228
Posted Doc Dt. : 10/05/2021

Received with thanks From Sh./Smt./ M/s. : EMC LIMITED
The Sum of : Indian Rupees Four Lakhs Six Thousand Three Hundred Twenty-Nine Only
Towards the following : Premium collections

Sl No.	Dept. Code	Policy No.	Policy Status	End/Ren/Dec/Claim No.	Dev. Code	Off. Code	Source Code	Amount Collected	C/D GL Code	SL Code	Pay Mode	Bank Name	Bank Branch	Instrument No.	Instr. Dt./CC Exp. Dt.	
1	44	2018/1373	New	311800/44/201			LC00000	4,06,329.00	C	5083	AB0000030018	DC_LIN		UBINR2202	105080181	
								Total								2513

GST : Rs. 61982
GST NO OF Insured : 19AAACE78821Z7
Policy Type / Zone : EAR SUM INSURED
LESS THAN 100 CRORES

Note : For Payment by cheque, receipt will be valid subject to realisation of Cheque

FOR THE ORIENTAL INSURANCE COMPANY LTD
Cashier/Signatory



CIN: UB6010DL1947GOI007158 IRDA Regn. No. 556 - All the amounts mentioned in this report are in Indian Rupees

The Oriental Insurance Company Ltd.
CBU KOLKATA 7 RED CROSS PLACE , KOLKATA , , WEST BENGAL , 700001
19AAACT0627R3ZU
Tax Invoice

Office Code		: 311800 - CBU Kolkata GST NO :19AAACT0627R3ZU		ORIGINAL FOR RECIPIENT								
Invoice No.		: 192025755		Invoice Date : 10-05-2021								
Billing Details Sh./Smt./ M/s.		: EMC LIMITED 11, Dr. U.N. Brahmachari Street, Constantia Office Complex, 8th Floor (South Block), Kolkata-700017 Principal's Name: Power Grid Corporation of India Limited WB 700017 STATE CODE :19 GSTIN:19AAACE7582J127 UIN : 0										
Towards HSN/SAC - 997137 - General Insurance Services			Tax is Payable on Reverse Charge :No									
Sl No.	Dept Code	Policy No.	Policy Status	Endorsement No	Amount Collected	Taxable Value	IGST Perc	IGST Amt	CGST Perc	CGST Amt	SGST/UT GST Perc	SGST/UTGST Amt
1	44	2018/1373	Endorsed	2018/1373/012	4,06,329.00	3,44,347.00			9%	30,991.00	9%	30,991.00
Total					4,06,329.00	3,44,347.00				30,991.00		30,991.00
The Sum of		: Indian Rupees Four Lakhs Six Thousand Three Hundred Twenty-Nine Only										
Policy Type / Zone		: EAR SUM INSURED LESS THAN 100 CRORES					FOR THE ORIENTAL INSURANCE COMPANY LTD Re. 1/- Rev. Stamp Cashier / Authorised Signatory					
Note : For Payment by cheque , receipt will be valid subject to realisation of Cheque												

दि ओरियण्टल इश्योरेंस कं. लि.
The Oriental Insurance Co. Ltd.
भारत सरकार का उपक्रम / (A Govt. of India Undertaking)
कार्पोरेट बिजनेस यूनिट / Corporate Business Unit
7, रेड क्रॉस प्लेस / 7, Red Cross Place
कोलकाता-700 001 / Kolkata-700 001

EAR SUM INSURED LESS THAN 100 CRORES - ENDORSEMENT SCHEDULE

Attached to and forming part of Policy No : 311800/44/2018/1373
 Endorsement No : 311800/44/2018/1373/012 Endorsement Date : 05/05/2021
 Endorsement Effective From 00:00 On 11/05/2021 To Midnight Of 31/08/2021
 Insured's Code : AB0000030018 Issue Office Code : 311800
 Insured's Name : EMC LIMITED (GSTIN: 19AAACE7582J1Z7) Issue Office Name : CBU Kolkata (GSTIN: 19AAACT0627R3ZU)
 Address : 11, Dr. U.N. Brahmachari Street, Constantia Office Complex, 8th Floor (South Block), Kolkata-700017 Address : 7 RED CROSS PLACE KOLKATA WEST BENGAL 700001
 Principal's Name: Power Grid Corporation of India Limited CALCUTTA 700017

Agent/Broker Details

Dev.Off.Code :
 Agent/Broker : LC0000000198 SALASAR SERVICES INSURANCE BROKERS P LT
 Address : 23A NETAJI SUBHAS ROAD 6TH FLOOR KOLKATTA 700001,6TH FLOOR KOLKATTA 700001,MOB NO 9674516777, 9836318793, 9830141236 , 9836970832,CALCUTTA,WEST BENGAL,700001
 Tel/Fax/Email : 0361-234030/0333-2943438//

Total Premium : 406,329 Type of Endorsement : Extension of Period with change in Risk
 Collection No & Dt : DC_I_IND 4019000228 - 10/05/2021 GST INVOICE NO :192025755 UIN :0
 Co Insurance Details :

ENDORSEMENT

Notwithstanding anything contained herein to the contrary in the within mentioned policy it is hereby declared and agreed that at the request of the insured the date of expiry of the policy shall read as 31/08/2021 23:59 hRS and not as stated in the policy. In consequence whereof an additional premium amounting to Rs. 406329/-has been collected towards the extension.

Subject otherwise to the terms, conditions, exceptions, exclusions and limitations of the policy.

SCHEDULE OF PREMIUM

Cover Description	Original Sum Insured	Endorsement Sum Insured	Revised Sum Insured	Endorsement Premium
Basic Cover	61,38,47,844		61,38,47,844	7,36,617.00
ADD :STFI Inclusion Cover	61,38,47,844		61,38,47,844	61,385.00
ADD :Escalation Cost	18,41,54,353		18,41,54,353	2,20,985.00

Place : :
 Date : 05/05/2021



For and on behalf of
 The Oriental Insurance Company Limited

Authorised Signatory



All the Amounts mentioned in this policy are in INDIAN RUPEES

Page 1 of 2

Attached to and forming part of policy number 311800/44/2018/1373

ADD :Earthquake Cover	61,38,47,844	61,38,47,844	1,02,308.00
ADD :Third Party Liability Cover - New	50,00,000	50,00,000	469.00
LESS :RO UW Discount - Engineering			7,77,417.00
TOTAL PREMIUM			3,44,347.00
ADD :CGST			30,991.00
ADD :SGST			30,991.00
TOTAL AMOUNT			4,06,329.00

Total Amount in figures and words : Rs 4,06,329 (INDIAN RUPEES Four lakhs six thousand three hundred twenty-nine only)

The Insurance under this policy / endorsement is subject to following terms,conditions,warranties & clauses specified in the policy / endorsement:

All other terms/conditions/warranties/clauses in the policy remain unaltered

Warranted that in case of dishonour of premium cheque(s) the company shall not be liable under the endorsement and the endorsement shall be void ab initio

In witness whereof the undersigned begin authorised by and on behalf of the company has herein to set his hands.

Entered By : PINTU KUMAR MONDAL
Examined By : MITHU DASGUPTA

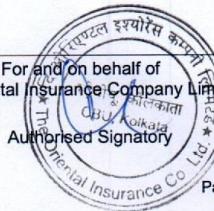
For and on behalf of
The Oriental Insurance Company Limited
कोलकाता
C.B.U, Kolkata
Authorised Signatory



Place : :
Date : 05/05/2021



For and on behalf of
The Oriental Insurance Company Limited
कोलकाता
C.B.U, Kolkata
Authorised Signatory



All the Amounts mentioned in this policy are in INDIAN RUPEES

Page 2 of 2

M/s SPML Infra



GOVERNMENT OF INDIA
MINISTRY OF LABOUR & EMPLOYMENT
OFFICE OF THE ASSISTANT LABOUR COMMISSIONER (CENTRAL)
KENDRIYA SADAN
CHIRUKANDI ROAD, RAMNAGAR, TARAPUR, SILCHAR-788 003, ASSAM
E-mail alc.sil-as@gov.in
TELEPHONE NO. 03842-268330

No. 46 (27)/2017 - S / A

Dated - 14. 02. 2020

To

✓ **M/s SPML INFRA LIMITED**

P. G. C. I. L. CONTRACTOR
REPRESENTED THROUGH:

- (1) Mr. ANIL KUMAR SETHI, DIRECTOR
S/O SHRI PUNAM CHAND SETHI
- (2) Mr. SUSHIL KUMAR SETHI, DIRECTOR
S/O SHRI PUNAM CHAND SETHI

C/O PINKI SAHA, RAMNAGAR-5, NEAR MUKTISANGHA
P.O. RAMNAGAR, AGARTALA - 799002, TRIPURA (WEST)
E-mail ID -tripuragm@spml.co.in / Mobile No. 9485022162.

Subject: Contract Labour (Regulation and Abolition) Act, 1970 and its Central Rules, 1971 -
Renewal of Licence No. CLA / 26 / 2017 - S / A dated-10.02.2017.

Dear Sir,

Please refer to your Application No. Nil dated-Nil (received at this office on 06.02.2020)
for Renewal of Licence along with Rs. 100/- (Rupees ONE HUNDRED) only deposited through
bharatkosh.gov.in towards Renewal fee of the above noted Licence.

In this connection, please find enclosed herewith the original Licence duly
RENEWED UP TO 09. 02. 2021 under the provision of Section-13 (3) of the Contract
Labour (Regulation and Abolition) Act, 1970 read with Rule-29 of its Central Rules, 1971.

Please acknowledge the receipt of the same.

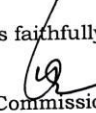
✓ Encl: 1 (ONE) LICENCE.



Copy forwarded to:

- (1) The Labour Enforcement Officer (Central), AGARTALA. A copy of the Form-II is enclosed.
- (2) The Assistant General Manager, Power Grid Corporation of India Limited, Kumarghat Sub-Division, PO. Kumarghat-799264, Tripura (North) for information.

Yours faithfully,


Assistant Labour Commissioner (Central)
Government of India
SILCHAR
Silchar & Registering/ Licensing Officer
Under C.L. (R&A) Act. 1970

Assistant Labour Commissioner (Central)
Government of India
SILCHAR

FORM-VI
(SEE RULE- 25(1))
GOVERNMENT OF INDIA
MINISTRY OF LABOUR & EMPLOYMENT
OFFICE OF THE LICENSING OFFICER
AND ASSISTANT LABOUR COMMISSIONER (CENTRAL)
COLLEGE ROAD, SILCHAR-788004, DIST. CACHAR, ASSAM

LICENCE NO. CLA/26/2017-S/A

DATE: 10.02.2017

LICENCE FEE PAID	Rs.150.00 (RUPEES ONE HUNDRED FIFTY ONLY)	DEMAND DRAFT No. 425543 Dated - 08.02.2017 STATE BANK OF INDIA, AGARTALA BRANCH
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L I C E N C E

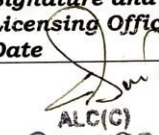
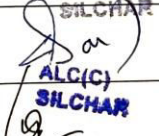

- Licence is hereby granted to **M/s SPML INFRA LIMITED, P. G. C. I. L. CONTRACTOR, REPRESENTED THROUGH: (1) Mr. ANIL KUMAR SETHI, DIRECTOR, S/O SHRI PUNAM CHAND SETHI (2) Mr. SUSHIL KUMAR SETHI, DIRECTOR, S/O SHRI PUNAM CHAND SETHI, C/O PINKI SAHA, RAMNAGAR-5, NEAR MUKTISANGHA, P.O. RAMNAGAR, AGARTALA - 799002, TRIPURA (WEST)** under Section 12(1) of the Contract Labour (Regulation and Abolition) Act, 1970 subject to the conditions specified in the ANNEXURE.
- The Licence is for doing the work - **"Construction of Sub-Station Package TRP-SS-03 for Tripura, associated with NER Power System Improvement Project vide Contract Agreement Ref. No. CC-CS/86-NER/SS-2651/1/G1/NOA-I/7072 dated-04.11.2016 and CC-CS/86-NER/SS-2651/1/GI/NOA-II/7073 dated-04.11.2016"** in the establishment of Assistant General Manager, Power Grid Corporation of India Limited, Kumarghat Sub-Division, PO. Kumarghat-799264, Tripura (North).
- The Licence shall remain in force **TILL 09.02.2018**

Date: 10.02.2017


Signature and Seal of Licensing Officer

 Asstt. Labour Commissioner (Central)
Silchar & Registering/Licensing Officer
Under C.L. (R&A) Act. 1970

R E N E W A L (Rule-29)

Date of Renewal	Fee paid for Renewal	Date of Expiry	Signature and Seal of Licensing Officer and Date
01-02-2018	₹-100/-	09-02-2019	 ALC(C) SILCHAR
11-02-2019	₹-100/-	09-02-2020	 ALC(C) SILCHAR
14-02-2020	₹-100/-	09-02-2021	 ALC(C) SILCHAR

M/s Technofab Engineering Limited



Form VI

(Under Rule 25(1) of the Contract Labour (Regulation and Abolition) Central
Rules, 1971)

Government of India
Office of the Licensing Officer

LICENCELicence No: **CLRA/ALCSILCHER/2021/L-55**Date: **18-Mar-2021**

1. Licence is hereby granted to **M/s. TECHNOFAB ENGINEERING LIMITED, 507 EROS APARTMENT, 56 NEHRU PLACE, New Delhi - 110019**, through **ARJUN GUPTA / MANAGING DIRECTOR** under sub-section (1) of section 12 of the Contract Labour (Regulation and Abolition) Act, 1970 (37 of 1970) subject to the conditions specified in the Annexure.
2. Name and Location of work **Service contract for DMS package for TRI-DMS /5 associated with NER power system improvement project vide notification of award No-CC-CS/86-NER/REW-2988/1/G2/NOA-II/7/7171 DATED-22.02.2017.**, for **POWERGRID CORPORATION OF INDIA LTD, 132 KV, KUMARGHAT SUB - DIVISION , North Tripura, Tripura - 799264**
3. Name of the principal employer **S. I. SINGH / SR. GENERAL MANAGER, RAMNAGAR-06, 3RD CROSSING, AGARTALA, West Tripura, Tripura - 799002**
4. Registration Certificate no. **A-REG/02/2002-S/A** and date of **04-Feb-2002** of the principal employer.
5. The licence shall remain in force till **17-Mar-2022** (date to be indicated).
6. Maximum number of contract labour to be employed on a single day under the licence: **100**
7. Fee Paid Rs **INR 75** (Transaction Id : **2402210001745**)
8. Security Deposit **INR 9000** (Transaction Id : **2402210001810**)
9. Remarks by Licencing Officer: **License is granted**

ANNEXURE

1. The licence shall be non-transferable.
2. The numbers of workmen employed as contract labour in the establishment shall not, on any day, exceed the maximum number specified in the licence.
3. Except as provided in the rules, the fees paid for the grant or, as the case may be, for renewal of the licence shall be non-refundable.
4. The rates of wages payable to the workmen by the contractor shall not be less than the rates prescribed for the Scheduled Employment under the Minimum Wages Act, 1948 (11 of 1948), where applicable, and where the rates have been fixed by agreement, settlement, award, or by the appropriate Government, not less than the rates so fixed.
5. (a). In case where the workmen employed by the contractor perform the same or similar kind of work as the workmen directly employed by the principal employer of the establishment, the wage rates, holidays, hours of work and other conditions of service of the workmen of the contractor shall be the same as applicable to the workmen directly employed by the principal employer of the establishment on the same or similar kind of work; provided that in the case of any disagreement with regard to the type of work the same shall be decided by the Deputy Chief Labour Commissioner (Central) whose decision shall be final.
(b). In other cases the wage rates, holidays, hours of work and conditions of service of the workmen of the contractor shall be such as may be specified in this behalf by the Deputy Chief Labour Commissioner (Central).
6. Every contract labour shall be entitled to allowances, benefits, facilities etc, as prescribed in the Contract Labour (Regulation and Abolition) Act, 1970 (37 of 1970) and rules made there under.
7. In every establishment where 20 or more women are ordinarily employed as there shall be provided 2 rooms of reasonable dimension for the use of their children under the age of six years. One of such rooms would be used as a play room for the children and the other as bed room for the children. For this purpose the contractor shall supply adequate number of toys and games in the play room and sufficient number of cots and beddings in the sleeping room. The standard of construction and maintenance of the crèches may be such as may be specified in this behalf by the Deputy Chief Labour Commissioner (Central).
8. No women shall be employed by any contractor before 6 a.m. or after 7 p.m.: Provided that this clause shall not apply to the employment of women in pit head baths, crèches and canteens and as mid-wives and nurses in hospitals and dispensaries.
9. The licensee shall notify any change in the number of workmen or the conditions of work to the Licensing Officer.

10. A copy of the licence shall be displayed prominently at the premises where the contract work is being carried on.
11. The contractor shall comply with all the provisions of the Act and these Rules.
12. The licensee shall, within fifteen days of the commencement and completion of each contract work, submit a return to the Inspector appointed under section 28 of the Contract Labour (Regulation and Abolition) Act, 1970 (37 of 1970) intimating the actual date of the commencement or, as the case may be, completion of such contract work in Form - VII.

eSign/DSC of Licensing Officer
Sudhir Kumar Chakma (ALC(C))
ALC SILCHER (ALCSILCHER)
alc.ghy-as@gov.in

Note: This is an online application summary applied on Shram Suvidha Portal.

Validity unknown

Digitally signed by J. J. J.
Date: 2021.03.18 20:27:48 IST





पावरग्रिड
POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



Annexure 19

Checklist for Safety Plan

CHECK LIST FOR SEFETY PLAN

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
1.	Annexure – 1A (SP) Safe work procedure for each activity i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. to be executed at site.	Yes/No	
2.	Annexure – 1B (SP) Manpower deployment plan, activity wise foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc.	Yes/No	
3.	Annexure – 2 (SP) List of Lifting Machines i.e. Crane, Hoist, Triffor, Chain Pulley Blocks etc. and Lifting Tools and Tackles i.e. D shackle, Pulleys, come along clamps, wire rope slings etc. and all types of ropes i.e. Wire ropes, Poly propylene Rope etc. used for lifting purposes along with test certificates.	Yes/No	
4.	Annexure – 3 (SP) List of Personal Protective Equipment (PPE), activity wise including the following along with test certificate of each as applicable: <ol style="list-style-type: none"> 1. Industrial Safety Helmet to all workmen at site. (EN 397 / IS 2025) with chin strap and back stay arrangement. 2. Safety shoes without steel toe to all ground level workers and canvas shoes for workers working on tower. 3. Rubber Gum Boot to workers working in rainy season / concreting job. 4. Twin lanyard Full Body Safety harness with shock absorber and leg strap arrangement 	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	<p>for all workers working at height for more than three meters. Safety Harness should be with attachments of light weight such as of aluminium alloy etc. and having a feature of automatic locking arrangement of snap hook and comply with EN 361 / IS 3521 standards.</p> <p>5. Mobile fall arrestors for safety of workers during their ascending / descending from tower / on tower. EN 353 -2 (Guided type fall arrestors on a flexible anchorage line.)</p> <p>6. Retractable type fall arrestor (EN380: 2002) for ascending / descending on suspension insulator string etc.</p> <p>7. Providing of good quality cotton hand gloves / leather hand gloves for workers engaged in handling of tower parts or as per requirement at site.</p> <p>8. Electrical Resistance hand gloves to workers for handling electrical equipment / Electrical connections. IS : 4770</p> <p>9. Dust masks to workers handling cement as per requirement.</p> <p>10. Face shield for welder and Grinders. IS : 1179 / IS : 2553</p> <p>11. Other PPEs, if any, as per requirement etc.</p>		
5.	<p>Annexure – 4 (SP)</p> <p>List of Earthing Equipment / Earthing devices with Earthing lead conforming to IECs for earthing equipments are – (855, 1230, 1235 etc.) gang wise for stringing activity/as per requirement</p>	Yes/No	
6.	<p>Annexure – 5A (SP)</p> <p>List of Qualified Safety Officer(s) along with their contact details</p>	Yes/No	
7.	<p>Annexure – 5B (SP)</p> <p>Details of Explosive Operator (if required), Safety officer / Safety supervisor for every erection / stringing gang, any other person nominated for safety, list of personnel trained in First Aid as well as brief information about safety set up by the</p>	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	Contractor alongwith copy of organisation of the Contractor in regard to safety		
8.	Annexure – 6 (SP) Copy of Safety Policy/ Safety Document of the Contractor's company	Yes/No	
9.	Annexure – 7 (SP) 'Emergency Preparedness Plan' for different incidences i.e. Fall from height, Electrocutation, Sun Stroke, Collapse of pit, Collapse of Tower, Snake bite, Fire in camp / Store, Flood, Storm, Earthquake, Militancy etc. while carrying out different activities under execution i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc.	Yes/No	
10.	Annexure – 8 (SP) Safety Audit Check Lists (Formats to be enclosed)	Yes/No	
11.	Annexure – 9 (SP) Copy of the module of Safety Training Programs on Safety, Health and Environment, safe execution of different activities of works for Contractor's own employees on regular basis and sub contractor employees.	Yes/No	
12.	Annexure – 10A (SP) Information along with documentary evidences in regard to the Contractor's compliance to various statutory requirements including the following:		
(i)	Electricity Act 2003 _____ [Name of Documentary evidence in support of compliance]	Yes/No	
(ii)	Factories Act 1948	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	<u>[Name of Documentary evidence in support of compliance]</u>		
(ii)	Building & other construction workers (Regulation of Employment and Conditions of Services Act and Central Act 1998) and Welfare Cess Act 1998 with Rules. <u>[Name of Documentary evidence in support of compliance]</u>	Yes/No	
(iv)	Workmen Compensation Act 1923 and Rules. <u>[Name of Documentary evidence in support of compliance]</u>	Yes/No	
(v)	Public Insurance Liabilities Act 1991 and Rules. <u>[Name of Documentary evidence in support of compliance]</u>	Yes/No	
(vi)	Indian Explosive Act 1948 and Rules. <u>[Name of Documentary evidence in support of compliance]</u>	Yes/No	
(vii)	Indian Petroleum Act 1934 and Rules. <u>[Name of Documentary evidence in support of compliance]</u>	Yes/No	
(viii)	License under the contract Labour (Regulation & Abolition) Act 1970 and Rules. <u>[Name of Documentary evidence in support of compliance]</u>	Yes/No	
(ix)	Indian Electricity Rule 1956 and amendments if	Yes/No	


S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	any, from time to time. _____ [Name of Documentary evidence in support of compliance]		
(x)	The Environment (Protection) Act 1986 and Rules. _____ [Name of Documentary evidence in support of compliance]	Yes/No	
(xi)	Child Labour (Prohibition & Regulation) Act 1986. _____ [Name of Documentary evidence in support of compliance]	Yes/No	
(xii)	National Building Code of India 2005 (NBC 2005). _____ [Name of Documentary evidence in support of compliance]	Yes/No	
(xiii)	Indian standards for construction of Low/ Medium/ High/ Extra High Voltage Transmission Line _____ [Name of Documentary evidence in support of compliance]	Yes/No	
(iv)	Any other statutory requirement(s) [please specify] _____ [Name of Documentary evidence in support of compliance]	Yes/No	
13.	Annexure – 10B (SP) Details of Insurance Policies alongwith documentary evidences taken by the Contractor for the insurance coverage against accident for all employees as below:		

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
(i)	Under Workmen Compensation Act 1923 and Rules. _____ [Name of Documentary evidence in support of insurance taken]	Yes/No	
(ii)	Public Insurance Liabilities Act 1991 _____ [Name of Documentary evidence in support of insurance taken]	Yes/No	
(iii)	Any Other Insurance Policies _____ [Name of Documentary evidence in support of insurance taken]	Yes/No	

EMPLOYER

SAMPLE COPY OF FILLED CHECKLIST

Safety Check List TL Const – 03, Revision-1(May, 2014)


**POWER GRID CORPORATION OF INDIA LTD.,
(CORPORATE OPERATION SERVICES)
SITE SAFETY INSPECTION / AUDIT CHECK LIST
TOWER ERECTION**

DATE OF INSPECTION: 27.02.2021 **NAME OF THE LINE:** Udei Purato Amara Por T/L
LOCATION NO: 38/0 **CLASSIFICATION OF SOIL & TYPE OF TOWER:** Dc+0
NAME OF THE AGENCY: Teems India Towers Lines Pvt. Ltd.
SITE ENGINEER / SUPERVISOR OF THE AGENCY: Mrs. Agnino Holain
SAFETY OFFICER OF THE AGENCY: Somen Jana.

S.NO:	CHECK LIST	YES / NO	REMARKS, IF ANY
1	Check List to be verified by the Agency's Site supervisor / Gang leader is available at Site and updated.	Yes	
2	Safe Work Procedures / Instructions in the language understood by the workers available with Site supervisor / Gang leader and workers are aware of the safe work procedures.	Yes	
3	Pep talk on safety issues (importance of safety, inspection of T&P and PPEs, proper use of PPEs, safe tower erection practices, safe shut down practices / safe material handling / house keeping , etc.) to the workers being done by the Safety Stewards / Supervisor / Engineer / Safety Officer of the Agency.	Yes	
4	Adequate warning / protection to public / children moving nearby ensured (RED FLAGS / CAUTION TAPE / ROPE / BOARDS).	Yes	
5	Appropriate safety messages / warnings are displayed at site to caution the workers.	Yes	
6	Back filling of soil completed before taking up tower erection.	Yes	
7	All the workers are provided with good quality SAFETY HELMETS confirming to BIS Standard IS:2925.	Yes	Brand: Kemeem
8	The workers engaged in Tower Erection work at height are provided with good quality FULL BODY DOUBLE LANYARD SAFETY BELTS confirming to BIS Standard IS: 3521 / EN 361.	Yes	Brand: Kemeem Odyogi
9	Other PPEs provided to the workers: SAFETY SHOES / COTTON HAND GLOVES for material handling / ELECTRICAL SAFETY GLOVES for S/D works	Yes	
10	The workers engaged in Tower Erection work at height are provided with FALL PROTECTION SYSTEMS like Rope Grab Mobile Fall Arrestor for ascending / descending the Tower / Retractable Fall Arrestor (for vertical movement) / Horizontal Life Line Rope for moving from one member to another member (Horizontal movement within the Tower).	Yes	
11	The fitters working on the tower have been trained on safety for work at height before deployment for tower erection works and Training Records maintained.	Yes	
12	The workers engaged in Tower Erection work at height are anchoring the LIFE LINE Rope / Lanyard of the Safety Belts to rigid support.	Yes	

Contd..2..

- 2 -

13	(a) First aid box with listed items as per BOCW Act, 1996 available. (b) Number of First Aid Trained persons and their names. (c) First Aid Register is available at site. (d) Nearby medical facilities for use during exigencies identified (Location / Phone No.).	Yes	
14	Shutdown of state EB Power Lines, wherever required, are taken, and no short cut methods used and chances taken.	N/A	Not-Required
15	All tie members / diagonal members and all bolts are fixed as the tower is erected progressively upwards to avoid uneven transmission of loads.	Yes	
16	All the nuts and bolts of STUB have been properly tightened.	Yes	
17	All step bolts have been properly tightened.	Yes	
18	Adequate guying arrangement provided at different levels to ensure proper stability of the tower being erected progressively.	Yes	
19	Atleast one vehicle (four wheeler) is available for use in case of emergencies.	Yes	
20	(a) Condition of derricks, pulleys and other load bearing T & Ps are found to be sound and free from any defect. (b) Whether all lifting T&P have been tested for safe working load and valid test certificates available and checked?	Yes	
21	The polypropylene / wire ropes are of adequate strength & free from any damage. The damaged / discarded ropes and steel wires are removed and not kept along with the other usable T&P, to prevent their use.	Yes	
22	The pulleys are of adequate strength / proper size (diameter). In open type pulleys, the locking arrangement and the safety pin are found to be healthy and fool proof.	Yes	
23	The derricks are provided with adequate guys and are properly tied to the tower main leg to prevent from slipping.	Yes	3 guys.
24	In case erection of tower is done with central derrick / Gin pole, adequate precautions are taken for guying / anchoring arrangement	Yes	
25	Adequate no. of fitters / ground helpers are deployed for the Tower Erection work .	Yes	
26	Whether the persons working in the ground are sufficiently away from the tower when erection is in progress?	Yes	
27	Whether adequate precautions are taken when working near Road / Rail / River / adjoining Power Line?		

SIGNATURE / NAME / DESIGNATION
OF POWERGRID REPRESENTATIVE

पावरग्रिड / POWERGRID
Copy To: क्षेत्र उदयपुर / NER, UDAIPUR

SIGNATURE / NAME / DESIGNATION
OF AGENCY'S REPRESENTATIVE



- (1) Regional In-charge / POWERGRID / _____
 (2) Projects In-charge (Region) / POWERGRID / _____
 (3) Site Incharge / POWERGRID / _____
 (4) Project Incharge / AGENCY / Zashub



Safety Check List TL Const – 04, Revision-1(May, 2014)

**POWER GRID CORPORATION OF INDIA LTD.,
(CORPORATE OPERATION SERVICES)**
SITE SAFETY INSPECTION / AUDIT CHECK LIST
STRINGING
DATE OF INSPECTION: 13.04.21 **NAME OF THE LINE:** Uden Pur to Amers Pur

REACH / LOCATION NO: AP-1810-22AP-1810

NAME OF THE AGENCY: Telem India Towerline Pvt. Ltd.

SITE ENGINEER / SUPERVISOR OF THE AGENCY: M.K. Quamy

SAFETY OFFICER OF THE AGENCY: Luman Jana.

S.NO:	CHECK LIST	YES / NO	REMARKS, IF ANY
1	Check List to be verified by the Agency's Site supervisor / Gang leader is available at Site and updated.	Yes	
2	Safe Work Procedures / Instructions in the language understood by the workers available with Site supervisor / Gang leader and workers are aware of the safe work procedures.	Yes	
3	Pep talk on safety issues (importance of safety, inspection of T&P and PPEs, proper use of PPEs, safe stringing practices, safe shut down practices, safe material handling / house keeping , safety to public / children, etc.) to the workers being done by the Safety Stewards / Supervisor / Engineer / Safety Officer of the Agency.	Yes	
4	Adequate warning / protection to public / children moving nearby ensured (RED FLAGS / CAUTION TAPE / ROPE / BOARDS).	Yes	
5	Flag men are posted at all the intermediate Spans / Towers with proper SIGNALING FLAGS AND COMMUNICATION GADGETS and they are keeping watch over the movement of general public / children and warning them when they come close.	Yes	
6	Number of walkie Talkie available at Site & their healthiness.	NO	Not Available
7	All the workers are provided with good quality SAFETY HELMETS confirming to BIS Standard, IS:2925.	Yes	Brand: Karoam
8	The workers engaged in Tower Erection work at height are provided with good quality FULL BODY DOUBLE LANYARD SAFETY BELTS confirming to BIS Standard IS:3521 / EN 361.	Yes	Brand: Karoam
9	Other PPEs provided to the workers: SAFETY SHOES / COTTON HAND GLOVES for material handling / ELECTRICAL SAFETY GLOVES for S/D works	Yes	Udyogi AS Per Life Requirement
10	The workers engaged in work at height are provided with FALL PROTECTION SYSTEMS like Rope Grab Mobile Fall Arrestor for ascending / descending the Tower / Retractable Fall Arrestor (for vertical movement from cross arm to conductor / roller) / Horizontal Life Line Rope for moving from one member to another member (Horizontal movement within tower).	Yes	
11	The fitters working on the tower have been trained on safety for work at height before deployment for tower erection works and Training Records maintained.	Yes	
12	Life Line Rope / Lanyard of the Safety Belts are properly anchored / looped while the person is working at height / moving along the insulator string / conductor.	Yes	
13	Whether the Towers have been permanently earthed?	Yes	

Contd..2..

- 2 -

14	(a) First aid box with listed items as per BOCW Act, 1996 available. (b) Number of First Aid Trained persons and their names. (c) First Aid Register is available at site. (d) Nearby medical facilities for use during exigencies identified (Location / Phone No.).	Yes	
15	Before commencing stringing activity, all Tower Members and Bolt & Nuts are fixed and the Bolts properly tightened. WRITTEN CLEARANCE to take up stringing obtained.	Yes	
16	Before commencing stringing activity, it is ensured that all missing Tower Members and Bolt & Nuts are replaced. RECORDS OF CONFIRMATION OF LIQUIDATION OF DEFECTS MAINTAINED.	Yes	
17	Proper fixing of split pins and their verification before hoisting the Insulator String is being ensured.	Yes	
18	Adequate number of BACK STAYS, depending on type of conductors (TWIN / QUAD / HEXA), are provided for all the cross arms of the end Tower, and are properly fixed to the deadman before taking up Tensioning.	Yes	
19	Shutdown of state EB power lines, wherever required, are taken with PTW, and no short cut methods used and chances taken.	N/A	Not Required
20	(a) Adequate capacity local earths suitable for appropriate voltage power lines are used to prevent any electric shock while working on or near charged EB Lines / Power Line crossings. These earths are properly fixed to ensure proper contact with the conductors. Healthiness of discharge rods / cables found OK. (b) Whether a person is stationed near EB Power Line isolating points, especially in LT Lines, to prevent inadvertent charging before return of PTW. (c) Name of the Engineer / Supervisor available / responsible at Site for ensuring proper fixing of local earths and their removal during power line shut downs & normalising.	N/A	as m
21	Atleast one vehicle (four wheeler) is available for use in case of emergencies.	Yes	
22	The polypropylene / wire ropes are of adequate strength & free from any damage. The damaged / discarded ropes and steel wires are removed and not kept along with the other usable T&P, to prevent their use.	Yes	
23	(a) Condition of Load bearing links such as D-shackles, Come-along clamps, steel ropes, pulleys, etc., are found to be sound and free from any defect. (b) Whether all lifting T&P have been tested for safe working load and valid test certificates available and checked?	Yes	
24	The Stringing M/C / Tensioner / Puller are properly anchored and also properly earthed to prevent any electric shock due to induction / lightning to the operators.	Yes	
25	Whether Braking arrangement of TSE Machines / conductor drum stand / E/W Turn table is proper?	Yes	
27	Proper scaffolding arrangements are made during stringing of conductor at Road crossings and Railway crossings.	N/A	Not Required
28	Whether FINAL SAG operation is being done by WINCH M/C.		

SIGNATURE / NAME / DESIGNATION
OF POWERGRID REPRESENTATIVE

SIGNATURE / NAME / DESIGNATION
OF AGENCY'S REPRESENTATIVE

Copy To:

- (1) Regional In-charge / POWERGRID / _____
- (2) Projects In-charge (Region) / POWERGRID / _____
- (3) Site Incharge / POWERGRID / _____
- (4) Project In-charge / AGENCY / Zashyab



FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



Annexure 20

GRC Details

TRIPURA STATE ELECTRICITY CORPORATION LIMITED

(A Govt. of Tripura Enterprise)



No. F. 5(85) / TSECL/2016-17/ 3308-40

dated, Agartala, the 27th February, 2017

To
The General Manager (NERPSIP)
Power Grid Corporation of India Ltd.
Royal Centre Flat No. 102
G.S. Road, Ulubari
Guwahati - 781007.

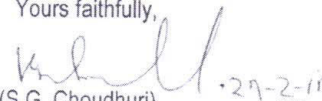
Sub : - Constitution of Site Level Grievance Redressal Committee (GRC) for NER Power System Improvement Project (NERPSIP) : Tripura

Ref : - NEAGT/NERPSIP / Grievance / 313, dated 19.01.2017.

Sir,

In inviting reference to the letter above, Site Level Grievance Redressal Committee (GRC) has been constituted and attached herewith in line with the State Specific ESPPF adopted by TSECL for the work covered under Tranche - I of ongoing World Bank aided NER Power System Improvement Project (NERPSIP) pertaining to the State of Tripura, to provide a trusted way to resolve environmental and social concerns of the Project and also to effectively address person / community / stake holder complaints arising out of the project implementation.

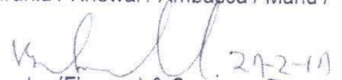
Yours faithfully,


(S.G. Choudhuri)

Director (Finance) & Company Secretary,
TSECL, Agartala.

Copy to :-

- 1) The P.S. to the CMD, TSECL, Agartala.
- 2) The GM (Technical), TSECL, Agartala.
- 3) The AGM (Transmission), TSECL, Agartala.
- 4-10) The AGM, EC - Gomati / Belonia / Sepahijala / II, Agartala / Khowai / Dhalai / Unakoti.
- 11-13) The DGM, TD, Agartala / Udaipur / Kumarghat.
- 14-16) The DGM (Civil) / DGM (P-II) / DGM (P-III), Transmission Circle, Agartala.
- 17-32) The DGM, ED - Amarpur / Bagafa / Udaipur / Belonia / Sabroom, Jampuijala / Sonamura / Bishalgarh / Mohanpur / Teliamura / Jirania / Khowai / Ambassa / Manu / Kamalpur / Kailashahar.


Director (Finance) & Company Secretary

SITE LEVEL GRIEVANCE REDRESSAL COMMITTEE

FOR NER POWER SYSTEM IMPROVEMENT PROJECT (TRANCHE – I): TRIPURA

A. 132 KV sub-station :

Package No.	Sl. No.	Sub-station	Site Level Grievance Redressal Committee	
			Nominated Official of TSECL	Nominated Official of PowerGrid
SS01	1	Belonia	1) DGM, TD, Udaipur, 2) Mgr, Belonia S/S.	Dy. Mgr, PGCIL, Belonia
	2	Bagafa	1) DGM, TD, Udaipur, 2) Mgr, Bagafa S/S.	
	3	Sabroom	1) DGM, TD, Udaipur, 2) Mgr, Sabroom S/S.	Dy. Mgr, PGCIL, Satchand
	4	Satchand	1) DGM, TD, Udaipur, 2) Mgr, Satchand S/S.	
SS02	5	Rabindranagar	1) DGM, TD, Agartala, 2) DGM (Civil), TC, Agartala 3) Sr.Mgr, Rabindranagar S/S	Manager, PGCIL, Udaipur
	6	Gokulnagar	1) DGM, TD, Agartala, 2) DGM (Civil), TC, Agartala 3) Sr.Mgr, Gokulnagar S/S	Dy. Mgr, PGCIL, Agartala
	7	Jirania	1) DGM, TD, Agartala, 2) DGM (Civil), TC, Agartala 3) Sr. Mgr, Jirania S/S	
	8	Udaipur	1) DGM, TD, Udaipur, 2) Sr.Mgr, Udaipur S/S.	Manager, PGCIL, Udaipur
	9	Rokhia	1) DGM, TD, Agartala, 2) DGM (Civil), TC, Agartala 3) Sr.Mgr, TSD,Agartala	Manager, PGCIL, Udaipur
SS03	10	Mohonpur	1) DGM, TD, Agartala, 2) DGM (Civil), TC, Agartala	Dy. Mgr, PGCIL, Agartala
	11	Amarpur	1) DGM, TD, Udaipur, 2) Mgr, Amarpur S/S	Manager, PGCIL, Udaipur
	12	Manu	1) DGM, TD, Kumarghat, 2) Sr.Mgr, Ambassa S/S	Asstt. GM, PGCIL, Kumarghat
	13	Ambassa		
	14	Dhalabil	1) DGM, TD, Agartala, 2) Sr.Mgr, Dhalabil S/SS/S	Dy. Mgr, PGCIL, Agartala
	15	Kailashahar	1) DGM, TD, Kumarghat, 2) Sr.Mgr, Kailashahar S/S	Asstt. GM, PGCIL, Kumarghat
	16	Dharmanagar	1) DGM, TD, Kumarghat, 2) Sr.Mgr, Dharmanagar S/S	



SITE LEVEL GRIEVANCE REDRESSEL COMMITTEE

FOR NER POWER SYSTEM IMPROVEMENT PROJECT (TRANCHE – I): TRIPURA

B. 132 KV line :

Package No.	Sl. No.	Line	Site Level Grievance Redressel Committee	
			Nominated Official of TSECL	Nominated Official of PowerGrid
TW01	1	Bagafa - Belonia	1) DGM, TD, Udaipur, 2) DGM (Civil), TC, Agartala 3) Sr.Mgr, TSD, Agartala.	Dy. Mgr, PGCIL, Belonia
	2	Belonia - Sabroom		
	3	Bagafa - Satchand		
TW02	4	Rabindranagar - Rokhia	1) DGM, TD, Agartala, 2) DGM (Civil), TC, Agartala 3) Sr.Mgr, Rabindranagar S/S	Manager, PGCIL, Udaipur
	5	Rabindranagar - Belonia		
	6	Udaipur - Bagafa		
	7	LILO of Surjamaninagar – Rokhia at Gokulnagar		
TW03	8	Kailashahar - Dharmanagar	1) DGM, TD, Kumarghat, 2) Sr.Mgr, Dharmanagar S/S 3) Sr.Mgr, TSD,Agartala	Asstt GM, PGCIL, Kumarghat
	9	Udaipur - Amarpur		
	10	LILO of Grid 79 Tilla - Dhalabil at Mohonpur		
	11	LILO of Ambassa – P. K. Bari at Manu		



**SITE LEVEL GRIEVANCE REDRESSEL COMMITTEE
FOR NER POWER SYSTEM IMPROVEMENT PROJECT (TRANCHE – I): TRIPURA**

C. 33 KV Sub-station and 33 KV lines :

Package No.	Sl. No.	New sub-station	Augmentation Sub-station	New 33 KV line	Renovation 33 KV line	Site Level Grievance Redressel Committee	
						Nominated Official of TSECL	Nominated Official of PowerGrid
DMS 01	1	Karbook	Rani	LILO of Tirthamukh - Silachari at Karbook	Jolaibari – Bagafa	1) DGM,ED-Amarpur 2) DGM,TD,Udaipur	Manager, PGCIL, Udaipur
	2	Muhuripur	Jolaibari	LILO of Jolaibari - Bagafa at Muhuripur	Silachari – Tirthamukh	1) DGM,ED-Bagafa 2) DGM, ED – Amarpur 3) DGM,TD,Udaipur	Dy. Mgr, PGCIL, Belonia
	3	Dalak (Chelagang)		Amarpur 132/33 KV S/S – Dalak		1) DGM,ED-Amarpur, 2) DGM,TD,Udaipur	Manager, PGCIL, Udaipur
	4	Garjee		Jatanbari - Dalak		1) DGM, ED - Udaipur, 2) DGM,TD,Udaipur	
	5	Chittamara		Belonia Existing 33/11 kV S/s- Chittamara		1) DGM,TD,Udaipur, 2) DGM ED-Belonia	Dy. Mgr, PGCIL, Belonia
	6	Maharani		Garjee – Chittamara		1) DGM,ED-Udaipur, 2) DGM,TD,Udaipur	Manager, PGCIL, Udaipur
	7	Chechua		Udaipur 132/33 kV s/s – Maharani		1) DGM,ED-Amarpur, 2) DGM, ED - Udaipur, 3) DGM,TD,Udaipur	
			Garjee – Maharani Amarpur 132/33 KV S/S – Chechua		1) DGM,ED-Amarpur, 2) DGM,TD,Udaipur		
DMS 02	8	Ekinpur	Hrishyamukh	Sabroom 132 KV S/s - Manughat	Belonia – Hrishyamukh	1) DGM,ED- Belonia 2) DGM,TD,Udaipur	Dy. Mgr, PGCIL, Belonia
	9	Manughat	Rajnagar	Manughat - Srinagar	Belonia – Rajnagar		Dy. Mgr, PGCIL, Satchand
	10	Rupaichari		Satchand 132/33 KV S/S – Srinagar		1) DGM,ED- Sabroom 2) DGM,TD,Udaipur	Dy. Mgr, PGCIL, Belonia
	11	Barpathari		Tapping point on existing Belonia - Hrishyamukh line - Srinagar		1) DGM,ED- Belonia 2) DGM,TD,Udaipur	
	12	Gabardi		Satchand 132/33 KV S/S – Rupaichari		1) DGM,ED- Jampuijala 2) DGM,TD,Agartala, 3) DGM(Civil),TC, Agartala	Dy. Mgr, PGCIL, Agartala
	13	Srinagar		Rajnagar - Ekinpur		1) DGM,ED- Belonia 2) DGM,TD,Udaipur	Dy. Mgr, PGCIL, Satchand
				LILO of existing Belonia - Rajnagar line at Barpathari Jolaibari - Silachari		1) DGM,ED-Sabroom 2) DGM,TD,Udaipur	Manager, PGCIL, Udaipur
			Jolaibari - Proposed Satchand Proposed Rupaichari – proposed Sabroom LILO of existing Suraj Mani Nagar -Takarjala line at Gabardi		1) DGM,ED-Sabroom 2) DGM,TD,Udaipur 1) DGM,ED-Sabroom 2) DGM,TD,Udaipur 1) DGM,ED-Sabroom 2) DGM,TD,Udaipur	Dy. Mgr, PGCIL, Satchand	
					1) DGM,ED- Jampuijala 2) DGM,TD,Agartala, 3) DGM(Civil),TC, Agartala	Dy. Mgr, PGCIL, Agartala	



**SITE LEVEL GRIEVANCE REDRESSAL COMMITTEE
FOR NER POWER SYSTEM IMPROVEMENT PROJECT (TRANCHE – I): TRIPURA**

C. 33 KV Sub-station and 33 KV lines :

Package No.	Sl. No.	New sub-station	Augmentation Sub-station	New 33 KV line	Renovation 33 KV line	Site Level Grievance Redressal Committee	
						Nominated Official of TSECL	Nominated Official of PowerGrid
DMS03	14	Sekerkote	Madhupur	LILO of Badharghat - Jangalia line at Sekerkote	Badharghat - Jangalia	1) DGM,ED- Bishalgarh 2) DGM, ED - Sonamura 3) DGM,TD,Agartala, 4) DGM(Civil),TC, Agartala	Dy. Mgr, PGCIL, Agartala
	15	Golaghati	Melaghar	Proposed Gokul Nagar - Golaghati	Rabindranagar - Kathalia		
	16	Durganagar	Kathalia	Takarjala - Golaghati	Rabindranagar - Melaghar	1) DGM,ED- Sonamura 2) DGM,TD,Agartala, 3) DGM(Civil),TC, Agartala	Dy. Mgr, PGCIL, Belonia
	17	Nidaya	Takarjala	Proposed Gokul Nagar - Durganagar	Badharghat - SM Nagar		
	18	Nalchar		Madhupur - Durganagar	SM Nagar - Takarjala		
				Kathalia - Nidaya		1)DGM,ED- Sonamura 2) DGM,TD, Agartala, 3)DGM(Civil),TC, Agartala	Manager, PGCIL, Udaipur
				Melaghar -Nalchar			
				Bishramganj -Nalchar		1)DGM,ED- Bishalgarh 2)DGM,TD,Agartala, 3)DGM(Civil),TC, Agartala	Dy. Mgr, PGCIL, Agartala
				Proposed Gokul Nagar 132/33 KV S/S - Tapping at Madhupur- Jangalia line			
				Bishramganj - Jangalia			
			Rajnagar - Nidaya		1)DGM,ED- Sonamura 2)DGM,TD,Agartala, 3)DGM(Civil),TC, Agartala	Dy. Mgr, PGCIL, Belonia	



**SITE LEVEL GRIEVANCE REDRESSEL COMMITTEE
FOR NER POWER SYSTEM IMPROVEMENT PROJECT (TRANCHE – I): TRIPURA**

C. 33 KV Sub-station and 33 KV lines :

Package No.	Sl. No.	New sub-station	Augmentation Sub-station	New 33 KV line	Renovation 33 KV line	Site Level Grievance Redressel Committee	
						Nominated Official of TSECL	Nominated Official of PowerGrid
DMS04	19	Simna	Hezamara	Dhalabil –Khowai	Teliamura – Kalyanpur	1)DGM,TD,Agartala, 2)DGM(Civil),TC, Agartala 3)DGM,ED-Mohanpur	Dy. Mgr, PGCIL, Agartala
	20	Barkathal	Khayerpur	Ampura – Khowai	Dhalabil – Kalyanpur	1)DGM,TD,Agartala 2)DGM,ED-Mohanpur 3) DGM, ED-Teliamura	
	21	Bamutia		Hezamara -Simna	Mohonpur – Hezamara	1)DGM,TD,Agartala, 2)DGM(Civil),TC, Agartala 3)DGM,ED-Mohanpur	
	22	Champak -Nagar		Tapping point on Mohanpur - Hezamara line to Simna	Mohonpur – Agartala	1)DGM,TD,Agartala, 2)DGM(Civil),TC, Agartala 3)DGM,ED-Mohanpur 4)DGM, ED - Jirania	
	23	Mungia -kami		Hezamara -Barkathal	Khayerpur – Jirania	1)DGM,TD,Agartala, 2)DGM(Civil),TC, Agartala 3)DGM,ED-Mohanpur 4)DGM, ED - Jirania	
	24	Taidu		Proposed Mohanpur -Barkathal		1)DGM,TD,Udaipur, 2)DGM,ED-Amarpur 3)DGM, ED- Mohanpur	
	25	Lembu -cherra		Durjoynagar – Bamutia		1)DGM,TD,Agartala, 2)DGM(Civil),TC, Agartala 3)DGM,ED-Mohanpur	
	26	Khowai		Lembucherra -Bamutia		1)DGM,TD,Agartala, 2)DGM(Civil),TC, Agartala 3)DGM,ED-Mohanpur 4)DGM, ED - Khowai	
	27	ADC Head Qtr		LILO of existing Agartala - Mohanpur at Lembucherra		1)DGM,TD,Agartala, 2)DGM(Civil),TC, Agartala 3)DGM, ED – Jirania 4) DGM, ED – Mohanpur	
	28	Ranir -bazar		Jirania –Champaknagar			
				LILO of existing Khayerpur - Jirania line at Ranirbazaar		1)DGM,TD,Agartala, 2)DGM(Civil),TC, Agartala 3)DGM,ED-Mohanpur 4)DGM, ED - Khowai	
				Jirania –ADC Hear Qtr			
				Champak Nagar –ADC		1)DGM,TD,Agartala, 2)DGM(Civil),TC, Agartala 3)DGM,ED-Mohanpur 4)DGM, ED - Khowai	
				Hezamara -Dhalabil			
			LILO of existing Ambassa - Teliamura at Mungiakami		1)DGM,TD,Agartala, 2)DGM(Civil),TC, Agartala 3)DGM,ED-Teliamura		
			Teliamura –Taidu		1)DGM,TD,Udaipur 2)DGM,ED-Amarpur		
			Chechua – Taidu				



**SITE LEVEL GRIEVANCE REDRESSEL COMMITTEE
FOR NER POWER SYSTEM IMPROVEMENT PROJECT (TRANCHE – I): TRIPURA**

C. 33 KV Sub-station and 33 KV lines :

Package No.	Sl. No.	New sub-station	Augmentation Sub-station	New 33 KV line	Renovation 33 KV line	Site Level Grievance Redressel Committee	
						Nominated Official of TSECL	Nominated Official of PowerGrid
DMS05	29	Tilla Bazar	Gandacherra	Ambassa - Jawhamagar	Ambassa – Teliamura	1)DGM, TD,Kumarghat, 2)DGM,ED-Kailashahar 3) DGM, ED-Ambassa	Asstt. GM, PGCIL, Kumarghat
	30	JawharNagar	Salema	LILO of existing Chhamanu-Manu line at Challengta		1)DGM, TD,Kumarghat, 2)DGM,ED- Ambassa 3) DGM, ED -Manu	
	31	Challengta	Rangrung	Proposed Jawhar Nagar - Dhumacherra		1)DGM, TD,Kumarghat, 2)DGM,ED- Manu	
	32	Dhumachhera		Proposed Manu 132/33 KV S/S – Dhumacherra			
	33	82 mile		Proposed Manu 132/33 KV S/S – 82 mile		1)DGM, TD,Kumarghat, 2)DGM,ED- Manu, 3)DGM, ED -Kamalpur	
	34	Durga Chowmohani		P K Bari – 82 mile			
				Kalaisahar existing 132/33 KV s/s -Tillabazaar		1)DGM, TD,Kumarghat, 2) DGM,ED- Manu, 3) DGM, ED-Kailashahar	
				Proposed Manu 132/33 KV S/S- tapping at Chawmanu - Manu line		1)DGM, TD,Kumarghat, 2)DGM,ED- Manu, 3) DGM, ED -Kamalpur	
			LILO of existing Salema - Kamalpur Line				



पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)

**POWER GRID CORPORATION
OF INDIA LIMITED**

(A Government of India Enterprise)



दुरभाष : (0381)2330045 (क)

NERPSIP Office,
Ramnagar-06(Middle); 3rd Crossing,, Agartala - 799002.

उत्तर पूर्वीय क्षेत्र / NORTH EASTERN REGION

Ref. No. NEAGT/NERPSIP-102/2017-18/ 477

Date: 19.06.2017

To,

The AGM (Transmission)
Tripura State Electricity Corporation Limited
79 Tilla, Transmission Circle
Agartala-799006, Tripura (West)

Sub: Nominations from local administration, panchayat/ADC, affected persons etc. as local representative for site level Grievance Redressal Committee (GRC).

Reference: - No. F. 5(85)/TSECL/2016-17/3308-40, dated 27.02.2017

Dear Sir,

With reference to the subject cited above, you may be aware that site level Grievance Redressal Committee (GRC) with members from POWERGRID and TSECL has already been constituted (*copy enclosed*). However as per the requirement of World Bank, the nominations from local administration, panchayat/ADC, affected persons etc. as local representative is also mandatory. This has already been discussed with World Bank during the meeting held on 01st - 02nd March, 2017 at Guwahati (*copy of World Bank Aide-Memoire enclosed*).

In view of above, you are kindly requested to arrange to get the nominations from local administration, panchayat/ADC, affected persons etc. as local representative for site level GRC.

On receipt of nominations, compliance will be communicated to the World Bank.

Thanking you,

Encl: As above

Copy to:

1. GM (NERPSIP), POWERGRID, Guwahati for kind information please



Yours faithfully,


DGM (NERPSIP)
POWERGRID, Agartala

पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
**POWER GRID CORPORATION
OF INDIA LIMITED**
(A Government of India Enterprise)



दूरभाष : (0381)2330045 (क)
NERPSIP Office,
Ramnagar-06(Middle); 3rd Crossing,, Agartala - 799002.

उत्तर पूर्वीय क्षेत्र / NORTH EASTERN REGION

Ref. No. NEAGT/NERPSIP-102/2018-19/ 587

Date: 27.03.2019

To,

→ The AGM (Transmission)
Tripura State Electricity Corporation Limited
79 Tilla, Transmission Circle
Agartala-799006, Tripura (West)

Sub: Nominations from local administration, panchayat/ADC, affected persons etc. as local representative for site level Grievance Redressal Committee (GRC) – Reminder-2

Reference: - No. F. 5(85) / TSECL/2016-17/3308-40, dated 27.02.2017

Dear Sir,

With reference to the subject cited above, you may be aware that site level Grievance Redressal Committee (GRC) with members from POWERGRID and TSECL has already been constituted (*copy enclosed*). However as per the requirement of World Bank, the nominations from local administration, panchayat/ADC, affected persons etc. as local representative is also mandatory. This has already been discussed with World Bank during the 5th Project Steering Committee meeting held on 12th November, 2018 at Guwahati (*copy of World Bank Aide-Memoire enclosed*).

In view of above, you are once again requested to arrange to get the nominations from local administration, panchayat/ADC, affected persons etc. as local representative for site level GRC.


On receipt of nominations, compliance will be communicated to the World Bank.

Thanking you,

Encl: As above



Yours faithfully,

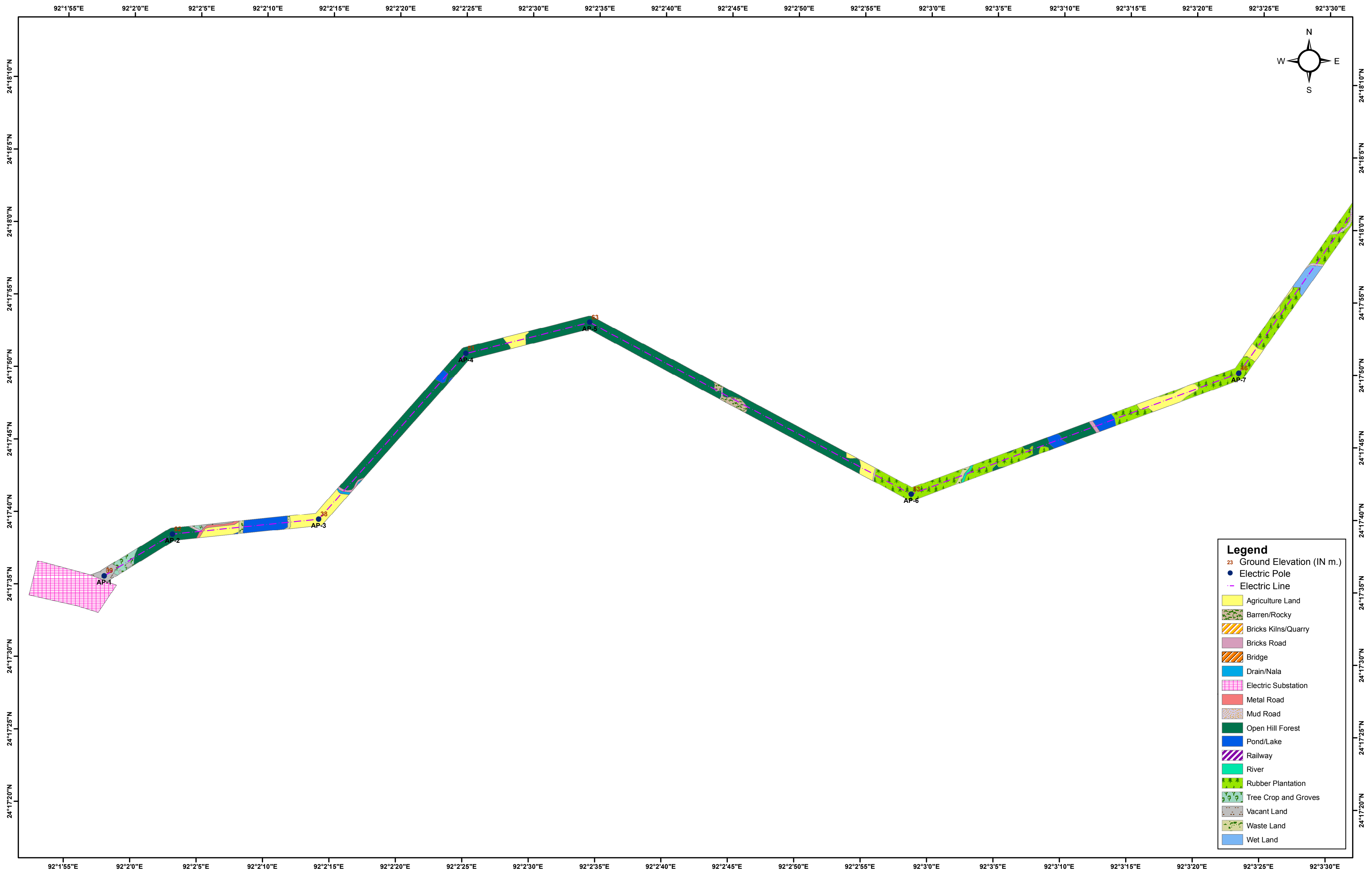

Uttam Debnath
Manager (NERPSIP)
POWERGRID, Agartala

Copy to:

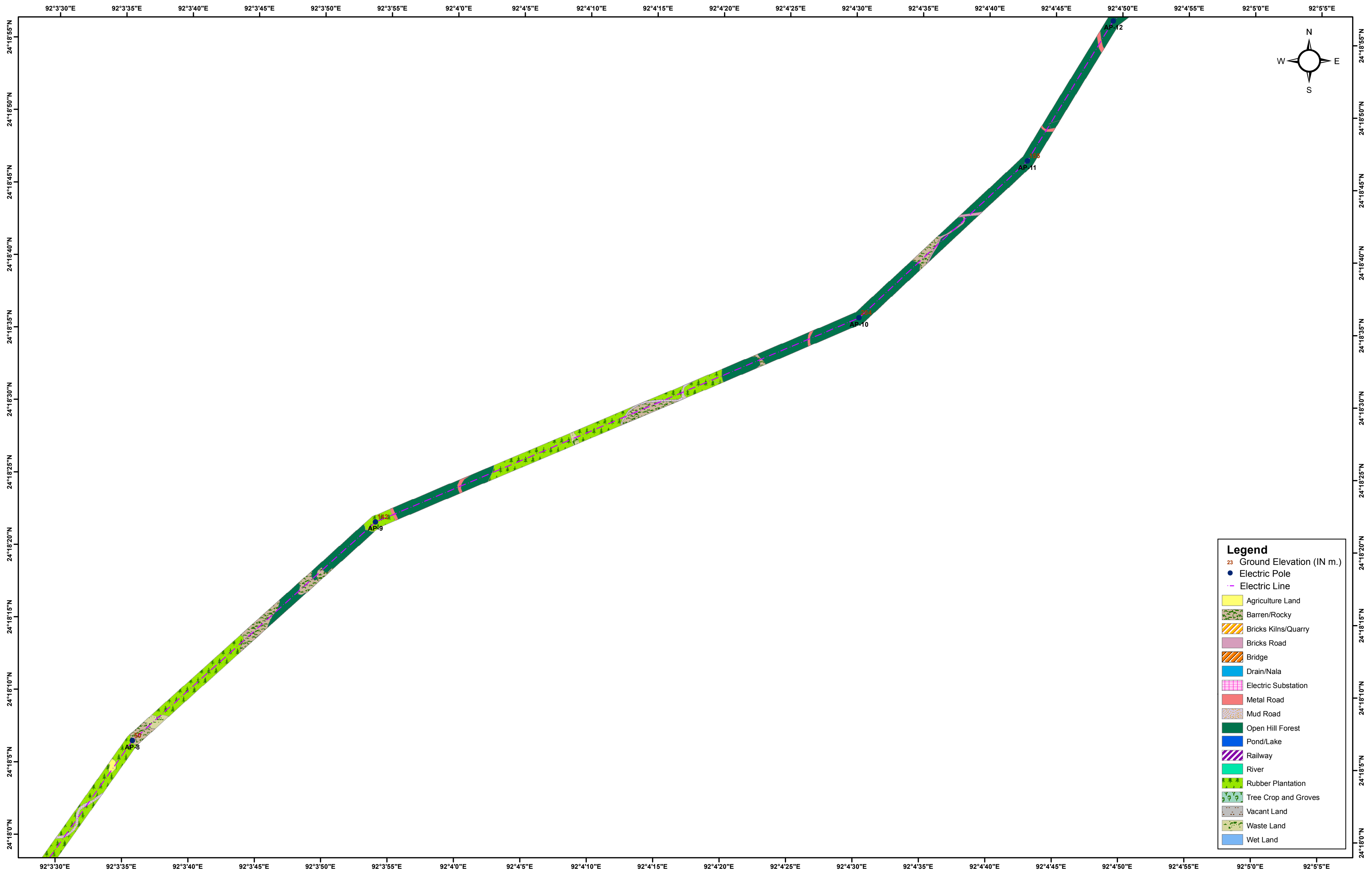
1. Sr. GM (NERPSIP), POWERGRID, Agartala for kind information please
2. CGM (NERPSIP), POWERGRID, Guwahati for kind information please

Annexure A and B

LAND USE/LAND COVER DETAILS OF 132 KV D/C TRANSMISSION LINE FROM KAILASHSAHAR TO DHARMANAGAR
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



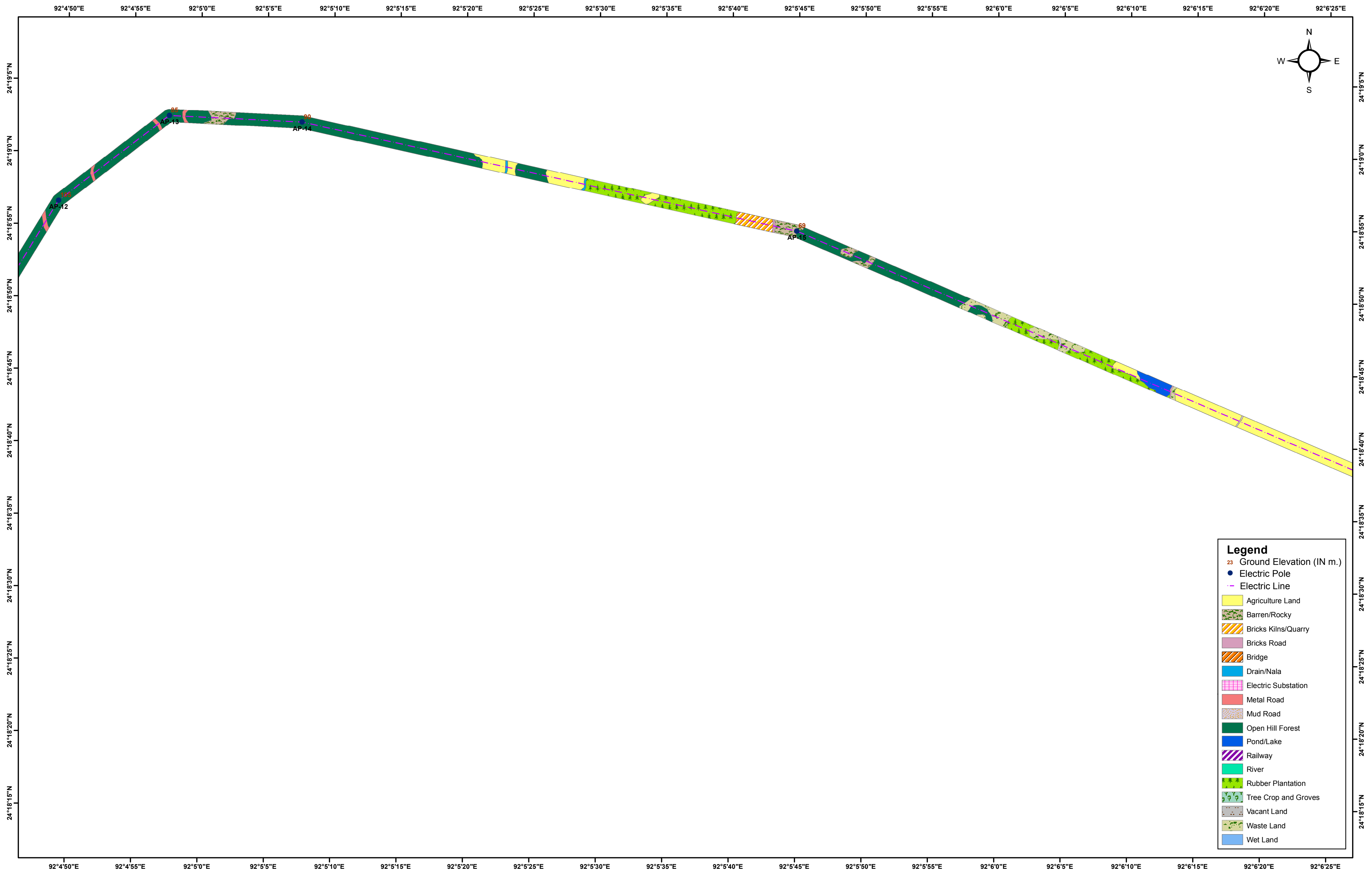
LAND USE/LAND COVER DETAILS OF 132 KV D/C TRANSMISSION LINE FROM KAILASHSAHAR TO DHARMANAGAR
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



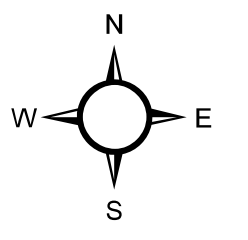
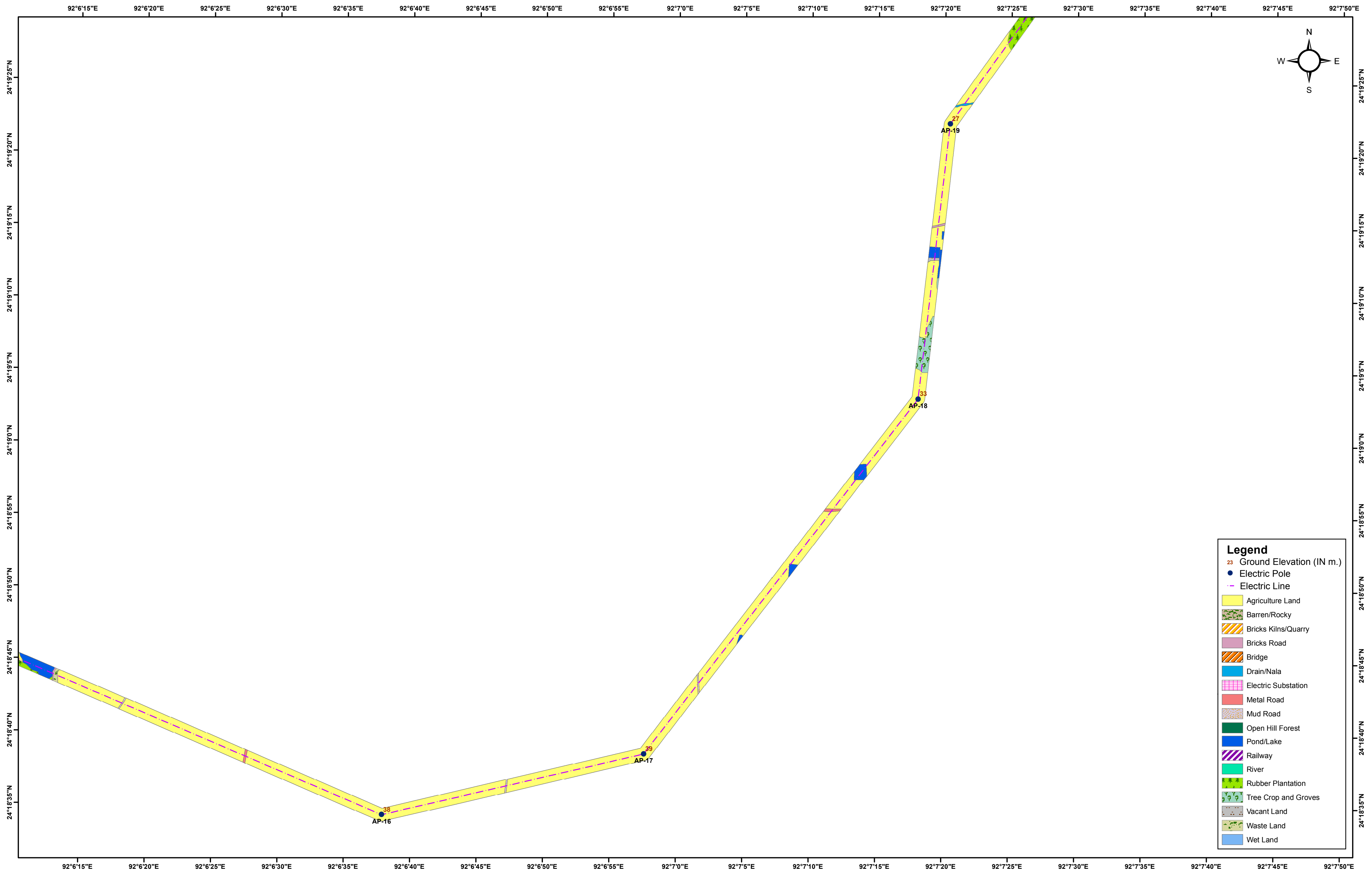
Legend

- 23 Ground Elevation (IN m.)
- Electric Pole
- - - Electric Line
- Agriculture Land
- Barren/Rocky
- Bricks Kilns/Quarry
- Bricks Road
- Bridge
- Drain/Nala
- Electric Substation
- Metal Road
- Mud Road
- Open Hill Forest
- Pond/Lake
- Railway
- River
- Rubber Plantation
- Tree Crop and Groves
- Vacant Land
- Waste Land
- Wet Land

LAND USE/LAND COVER DETAILS OF 132 KV D/C TRANSMISSION LINE FROM KAILASHSAHAR TO DHARMANAGAR
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,

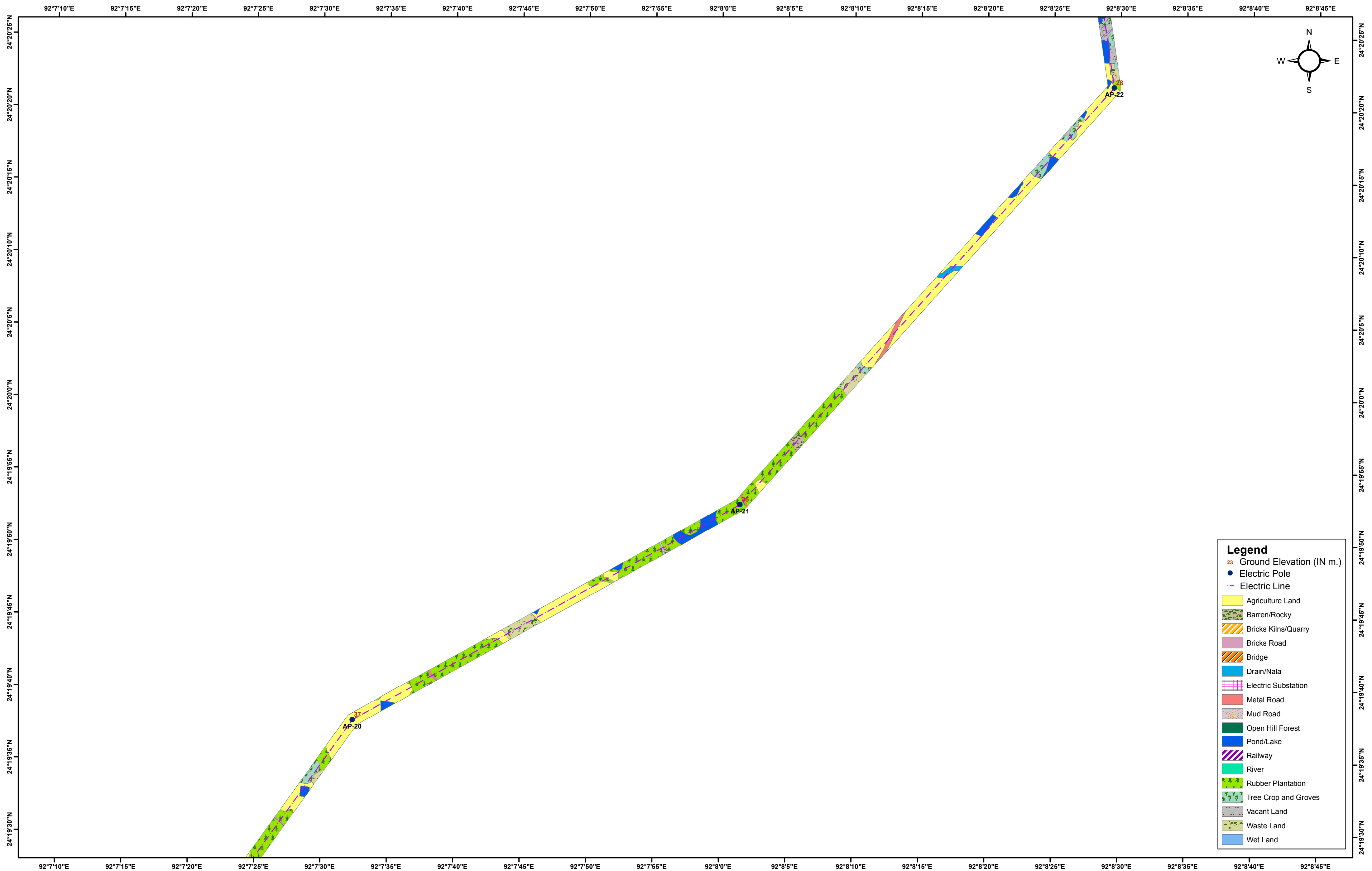


LAND USE/LAND COVER DETAILS OF 132 KV D/C TRANSMISSION LINE FROM KAILASHSAHAR TO DHARMANAGAR
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



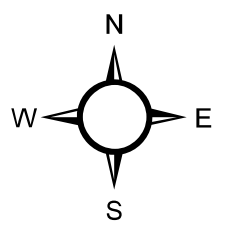
- Legend**
- 23 Ground Elevation (IN m.)
 - Electric Pole
 - - - Electric Line
 - Agriculture Land
 - Barren/Rocky
 - Bricks Kilns/Quarry
 - Bricks Road
 - Bridge
 - Drain/Nala
 - Electric Substation
 - Metal Road
 - Mud Road
 - Open Hill Forest
 - Pond/Lake
 - Railway
 - River
 - Rubber Plantation
 - Tree Crop and Groves
 - Vacant Land
 - Waste Land
 - Wet Land

LAND USE/LAND COVER DETAILS OF 132 KV D/C TRANSMISSION LINE FROM KAILASHSAHAR TO DHARMANAGAR
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,

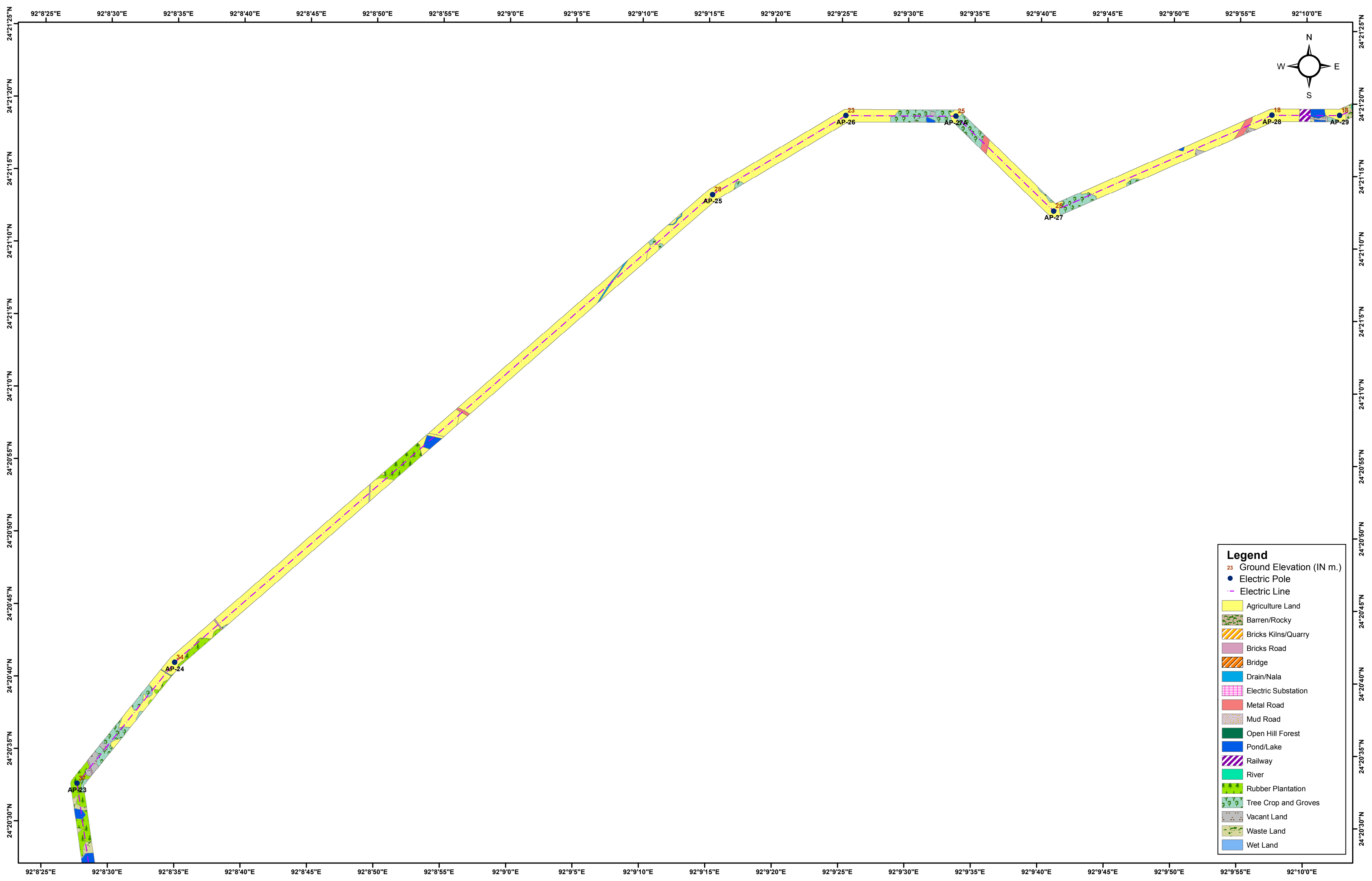


Legend

- 23 Ground Elevation (IN m.)
- Electric Pole
- - - Electric Line
- Agriculture Land
- Barren/Rocky
- Bricks Kilns/Quarry
- Bricks Road
- Bridge
- Drain/Nala
- Electric Substation
- Metal Road
- Mud Road
- Open Hill Forest
- Pond/Lake
- Railway
- River
- Rubber Plantation
- Tree Crop and Groves
- Vacant Land
- Waste Land
- Wet Land



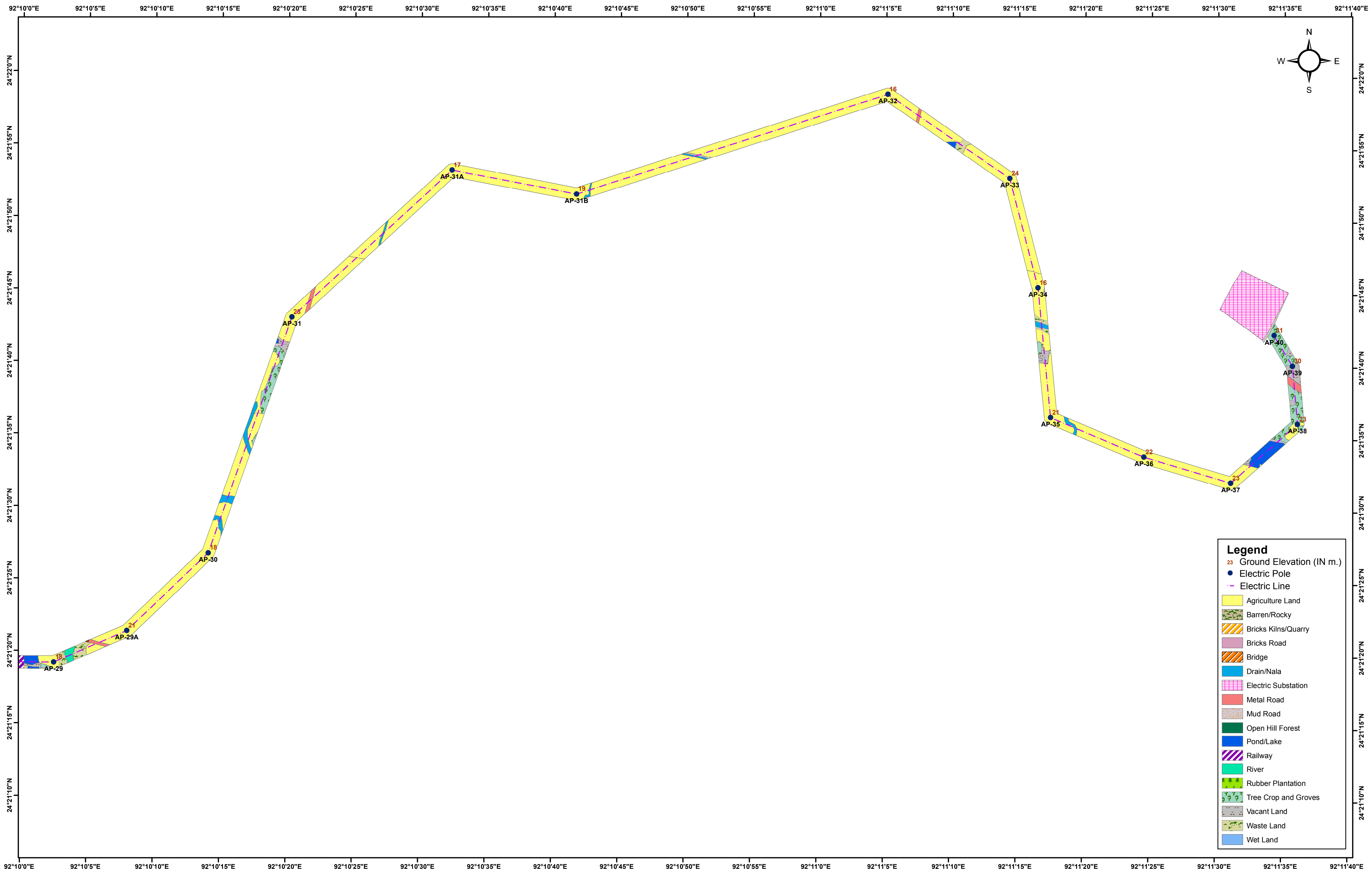
LAND USE/LAND COVER DETAILS OF 132 KV D/C TRANSMISSION LINE FROM KAILASHSAHAR TO DHARMANAGAR
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



Legend

- 23 Ground Elevation (IN m.)
- Electric Pole
- - - Electric Line
- Agriculture Land
- Barren/Rocky
- Bricks Kilns/Quarry
- Bricks Road
- Bridge
- Drain/Nala
- Electric Substation
- Metal Road
- Mud Road
- Open Hill Forest
- Pond/Lake
- Railway
- River
- Rubber Plantation
- Tree Crop and Groves
- Vacant Land
- Waste Land
- Wet Land

LAND USE/LAND COVER DETAILS OF 132 KV D/C TRANSMISSION LINE FROM KAILASHSAHAR TO DHARMANAGAR
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,

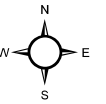


LAND USE/LAND COVER DETAILS OF 132 KV D/C PK. BARI AMBASSA TRANSMISSION LINE TAPING ARRANGMENT FOR LILO AT MANU S/S
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,

92°0'0"E

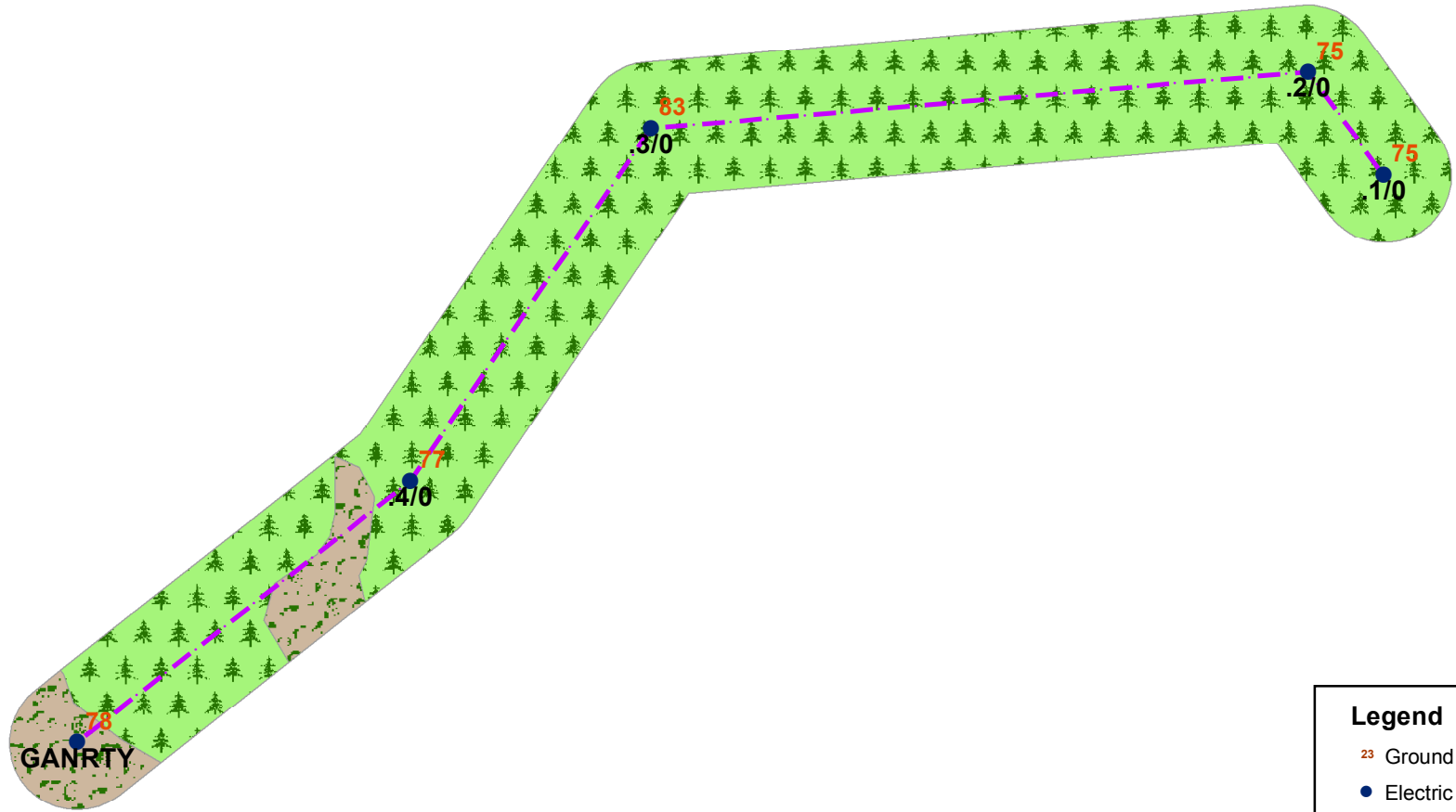
92°0'5"E

92°0'10"E



24°0'45"N

24°0'45"N



Legend

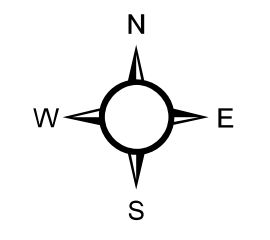
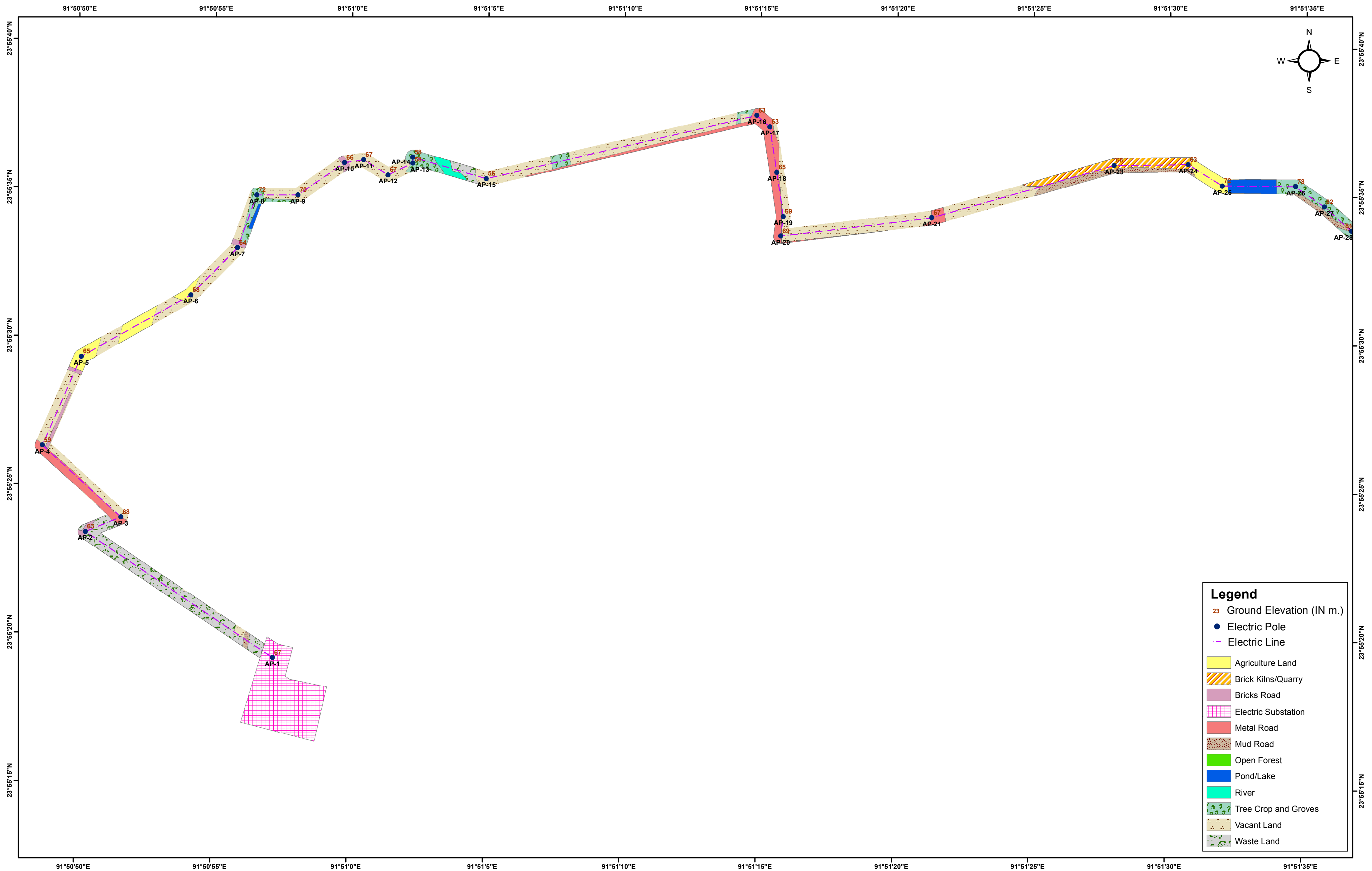
- 23 Ground Elevation (IN m.)
- Electric Pole
- Electric Line
- Rubber Plantation
- Waste Land

92°0'0"E

92°0'5"E

92°0'10"E

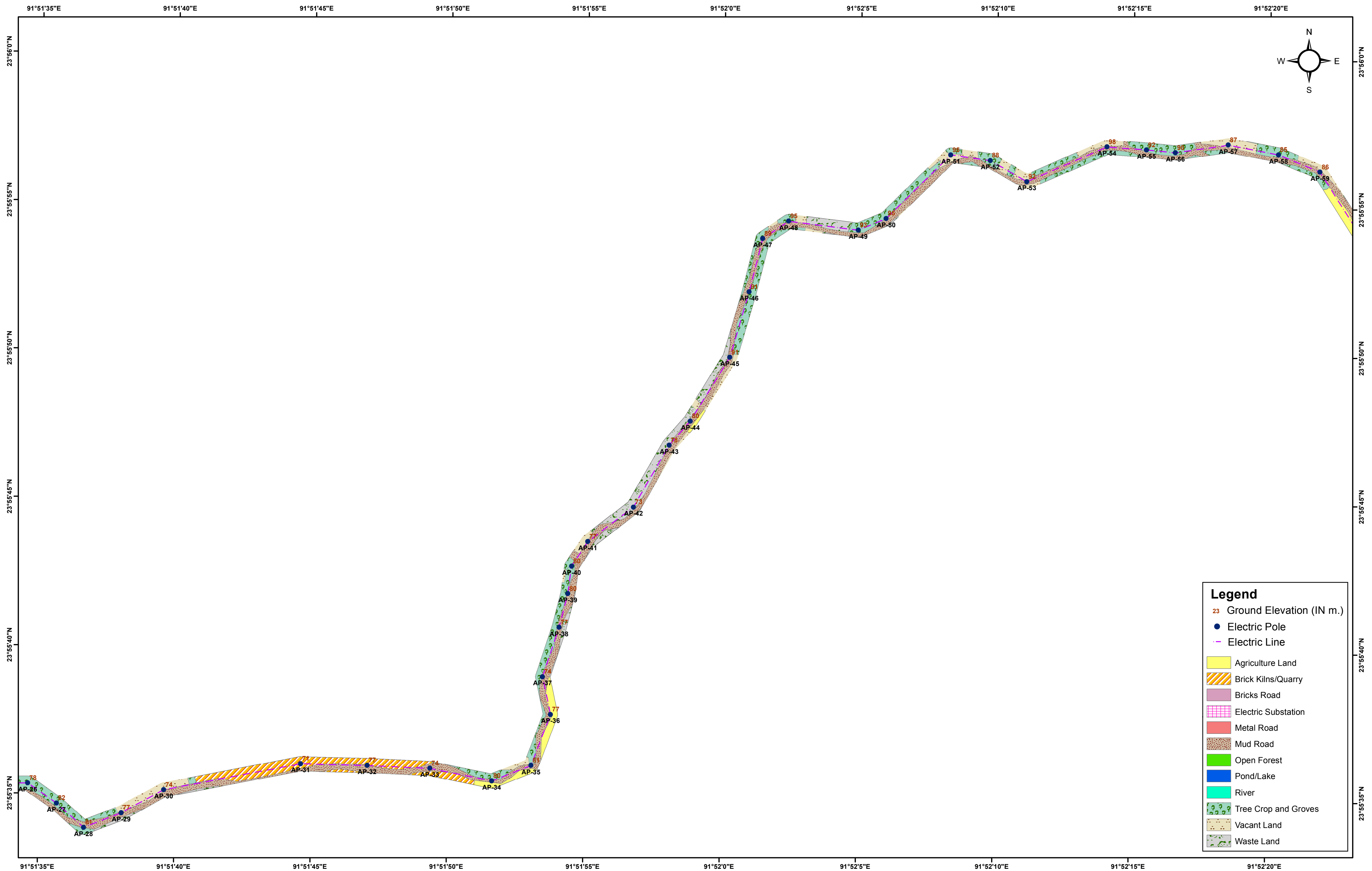
LAND USE/LAND COVER DETAILS OF AMBASSA EXISTING 132/33 KV S/S TO JAWHAR NAGAR
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



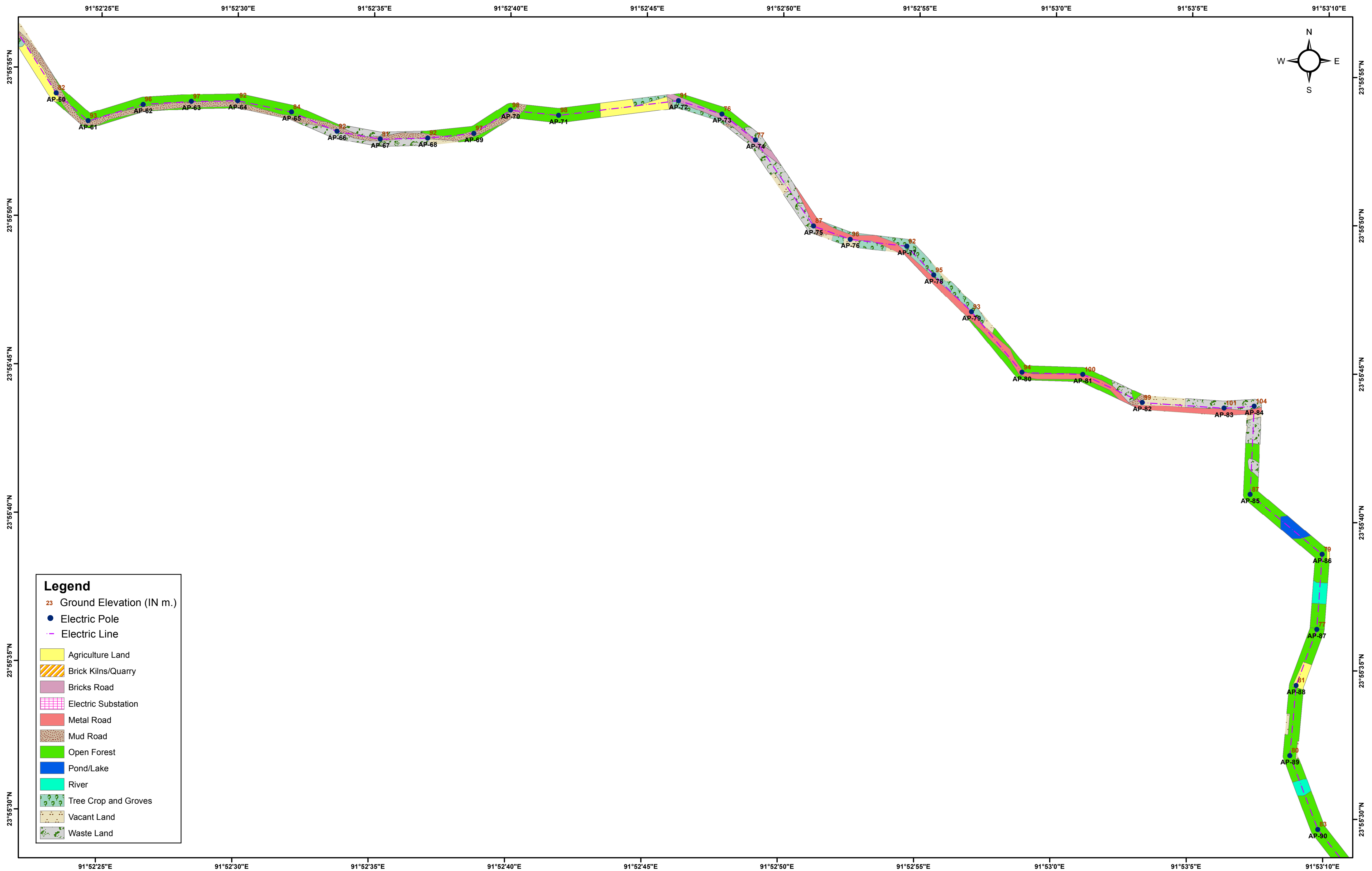
Legend

23	Ground Elevation (IN m.)
●	Electric Pole
- - -	Electric Line
[Yellow]	Agriculture Land
[Diagonal Lines]	Brick Kilns/Quarry
[Pink]	Bricks Road
[Grid]	Electric Substation
[Red]	Metal Road
[Dotted]	Mud Road
[Green]	Open Forest
[Blue]	Pond/Lake
[Cyan]	River
[Tree Symbols]	Tree Crop and Groves
[Light Green]	Vacant Land
[Dark Green]	Waste Land

LAND USE/LAND COVER DETAILS OF AMBASSA EXISTING 132/33 KV S/S TO JAWHAR NAGAR
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



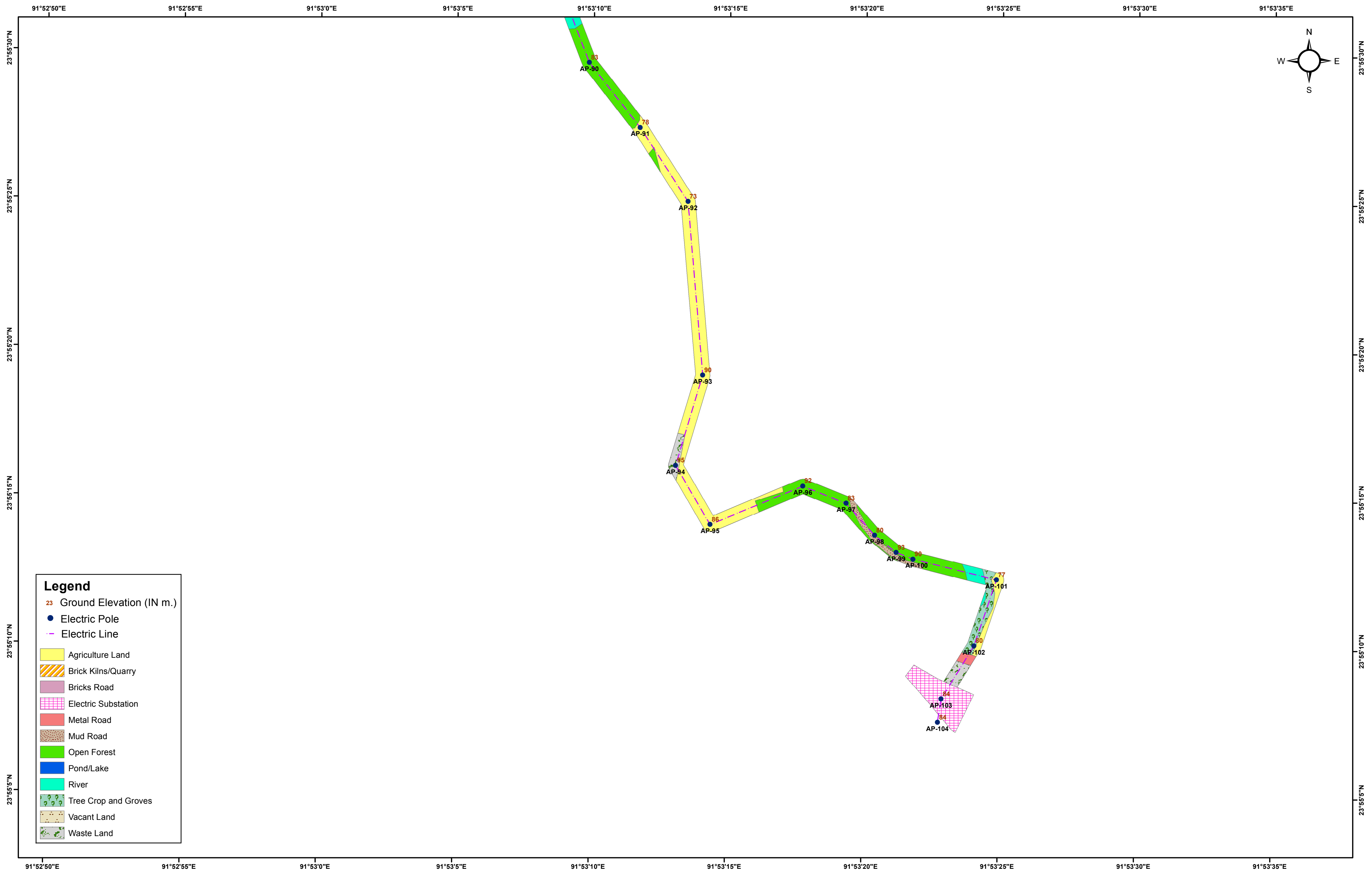
LAND USE/LAND COVER DETAILS OF AMBASSA EXISTING 132/33 KV S/S TO JAWHAR NAGAR
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



Legend

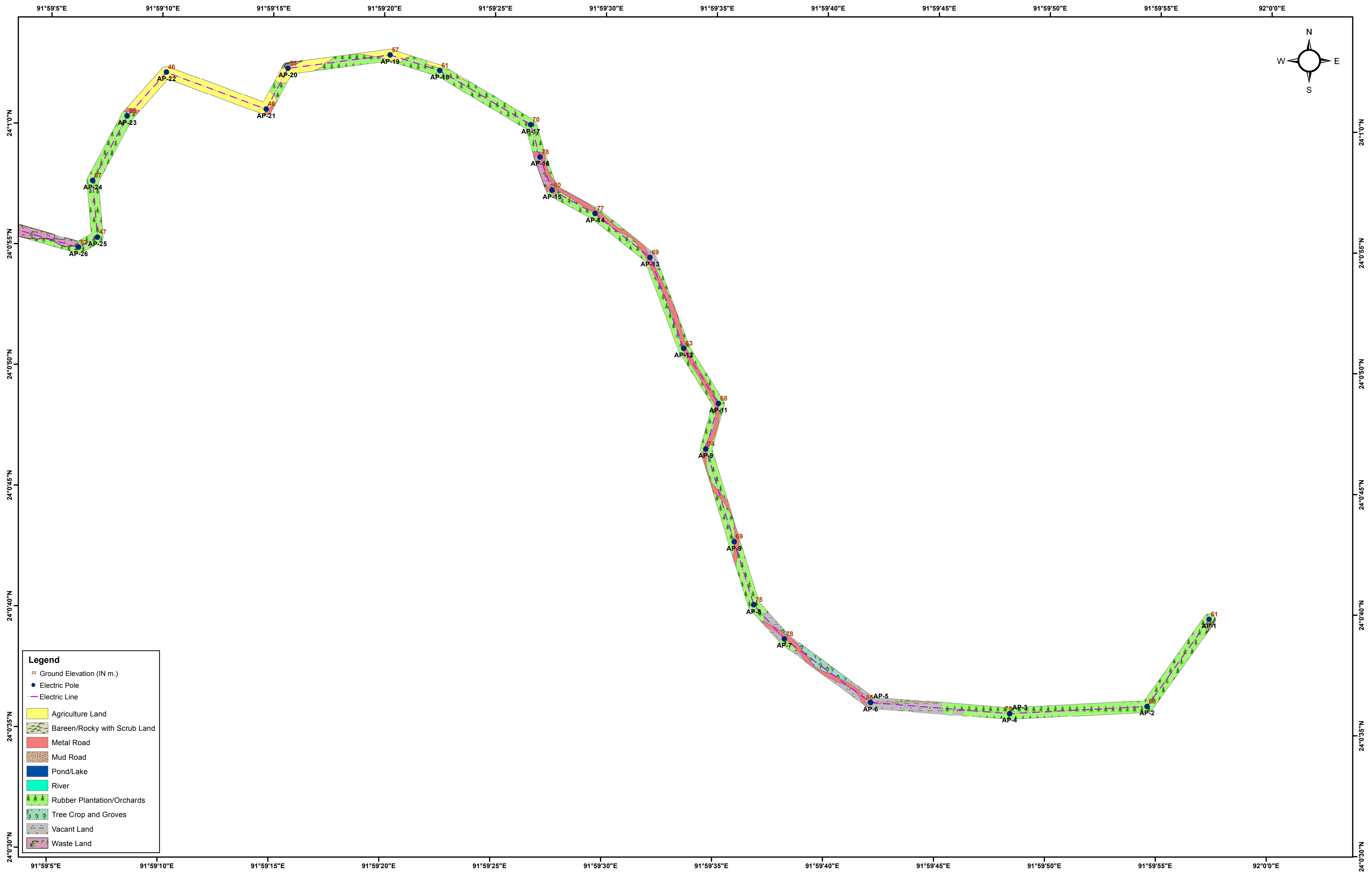
- 23 Ground Elevation (IN m.)
- Electric Pole
- Electric Line
- Agriculture Land
- Brick Kilns/Quarry
- Bricks Road
- Electric Substation
- Metal Road
- Mud Road
- Open Forest
- Pond/Lake
- River
- Tree Crop and Groves
- Vacant Land
- Waste Land

LAND USE/LAND COVER DETAILS OF AMBASSA EXISTING 132/33 KV S/S TO JAWHAR NAGAR
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,

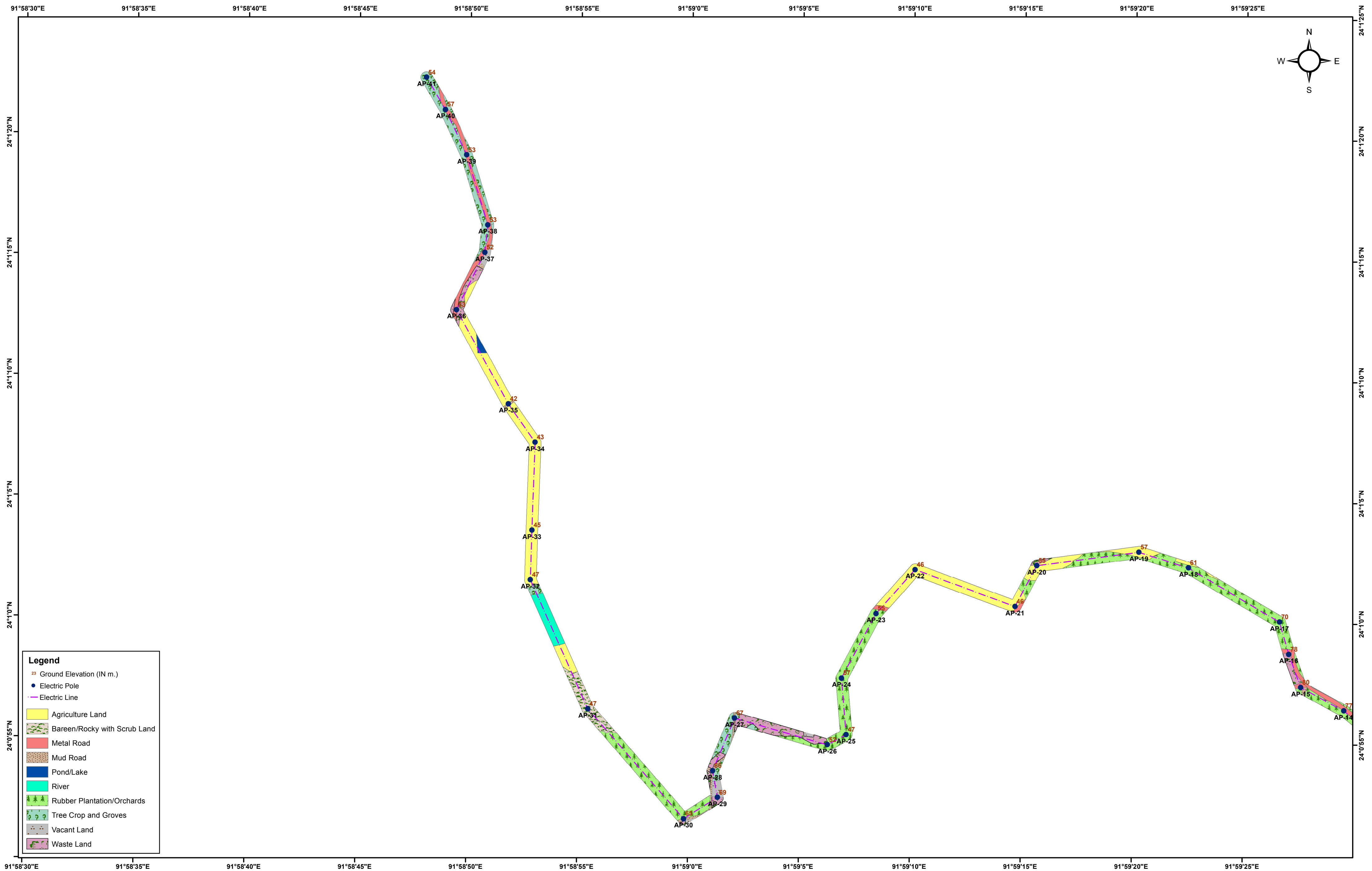


- Legend**
- 23 Ground Elevation (IN m.)
 - Electric Pole
 - - - Electric Line
 - Agriculture Land
 - Brick Kilns/Quarry
 - Bricks Road
 - Electric Substation
 - Metal Road
 - Mud Road
 - Open Forest
 - Pond/Lake
 - River
 - Tree Crop and Groves
 - Vacant Land
 - Waste Land

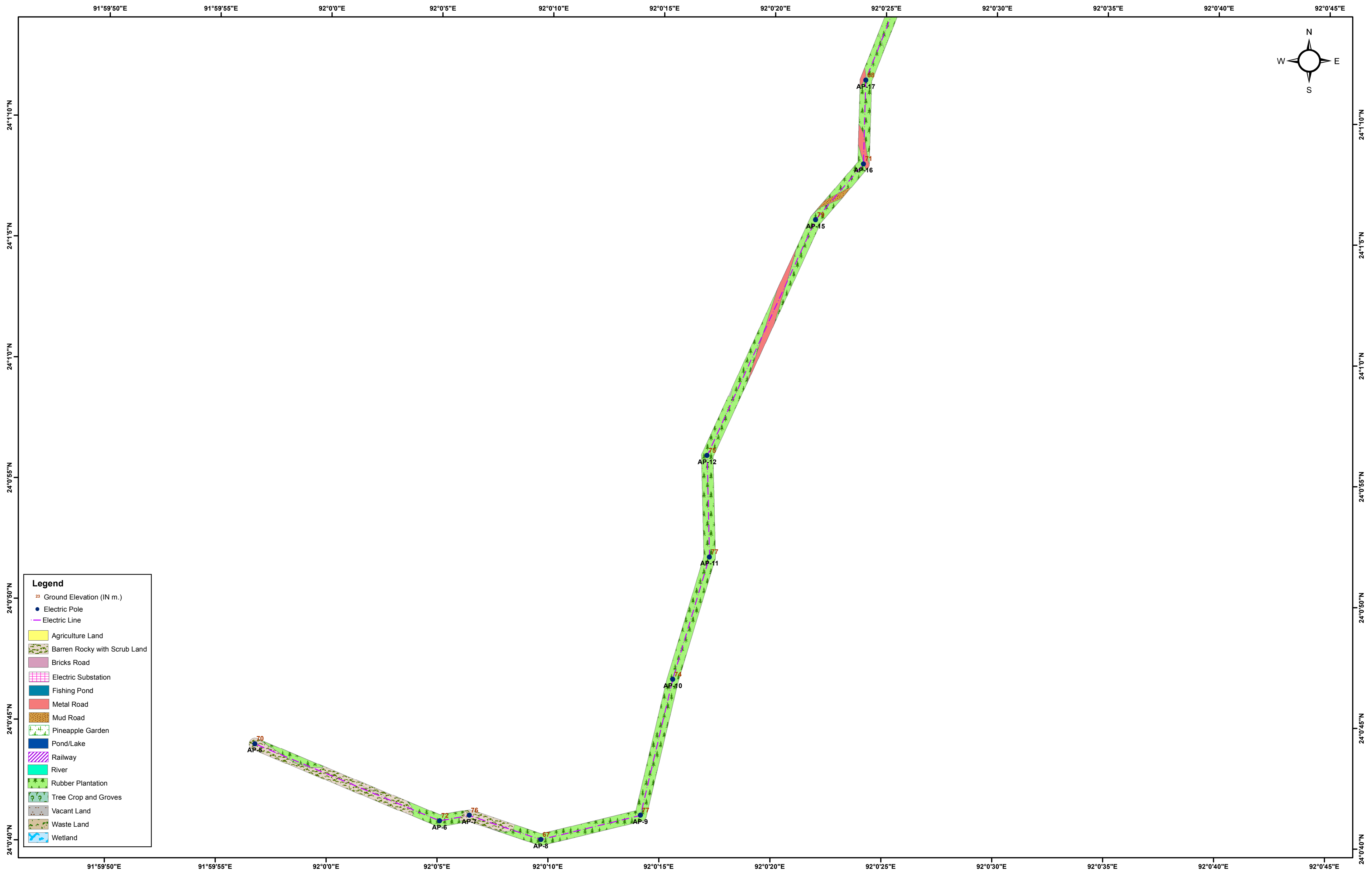
LAND USE/LAND COVER DETAILS OF PROPOSED 132/33 KV MANU S/S TO DHUMACHHERA
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



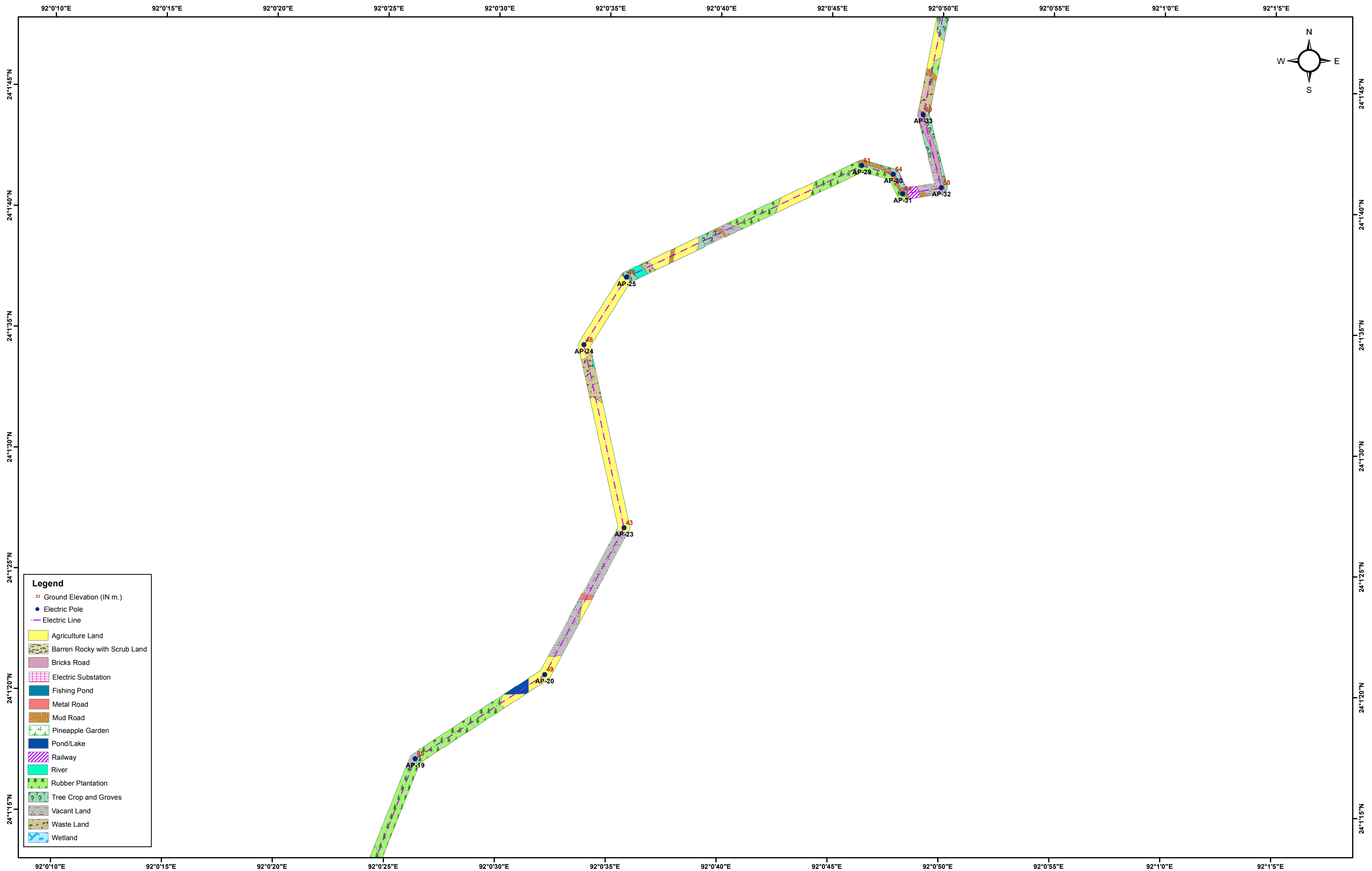
LAND USE/LAND COVER DETAILS OF PROPOSED 132/33 KV MANU S/S TO DHUMACHHERA
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



LAND USE/LAND COVER DETAILS OF MANU 132/33 KV S/S TO 82 MILE
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,

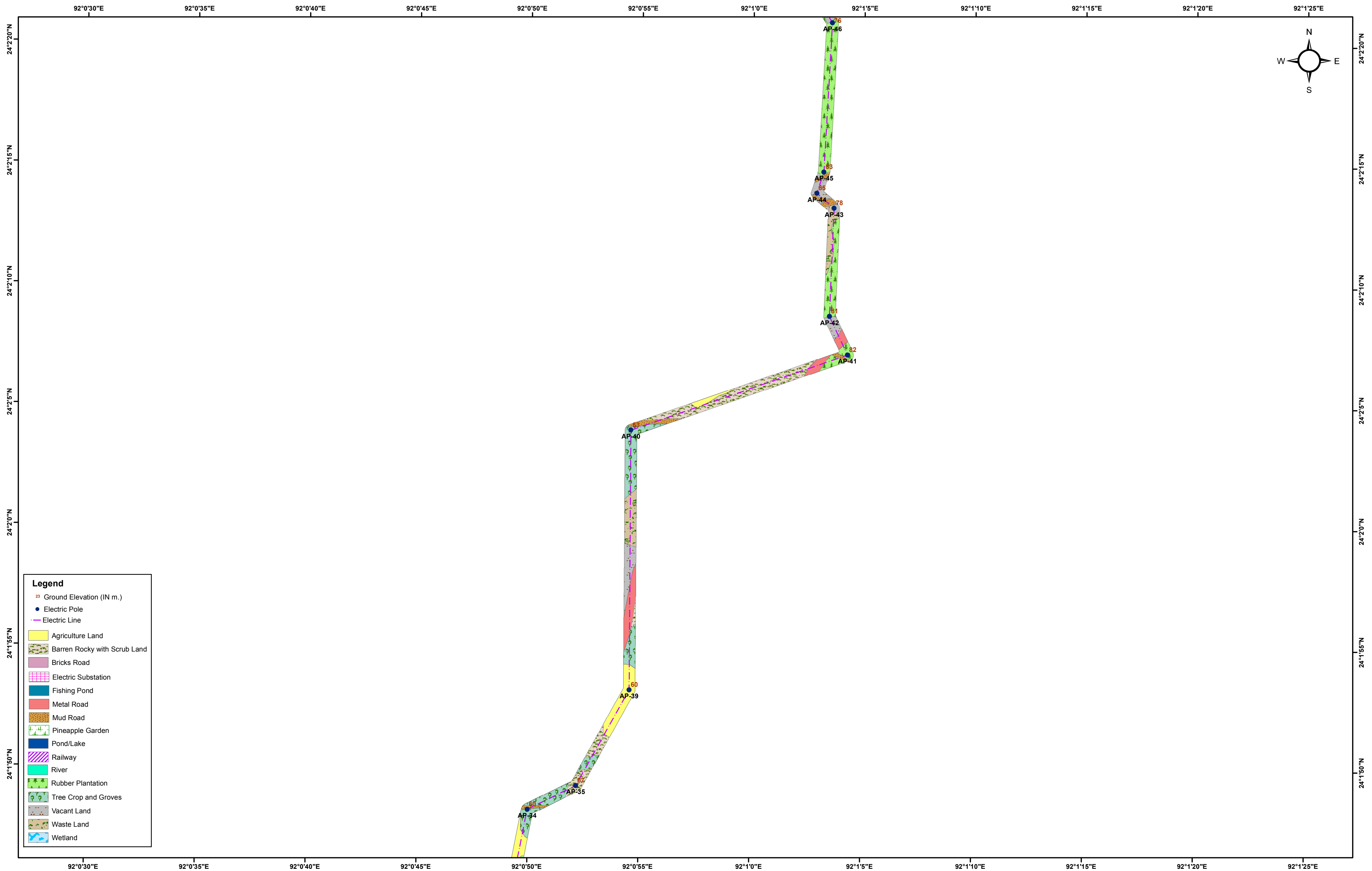


LAND USE/LAND COVER DETAILS OF MANU 132/33 KV S/S TO 82 MILE
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



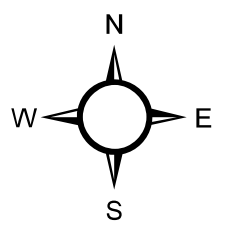
- Legend**
- 23 Ground Elevation (IN m.)
 - Electric Pole
 - Electric Line
 - Agriculture Land
 - Barren Rocky with Scrub Land
 - Bricks Road
 - Electric Substation
 - Fishing Pond
 - Metal Road
 - Mud Road
 - Pineapple Garden
 - Pond/Lake
 - Railway
 - River
 - Rubber Plantation
 - Tree Crop and Groves
 - Vacant Land
 - Waste Land
 - Wetland

LAND USE/LAND COVER DETAILS OF MANU 132/33 KV S/S TO 82 MILE
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,

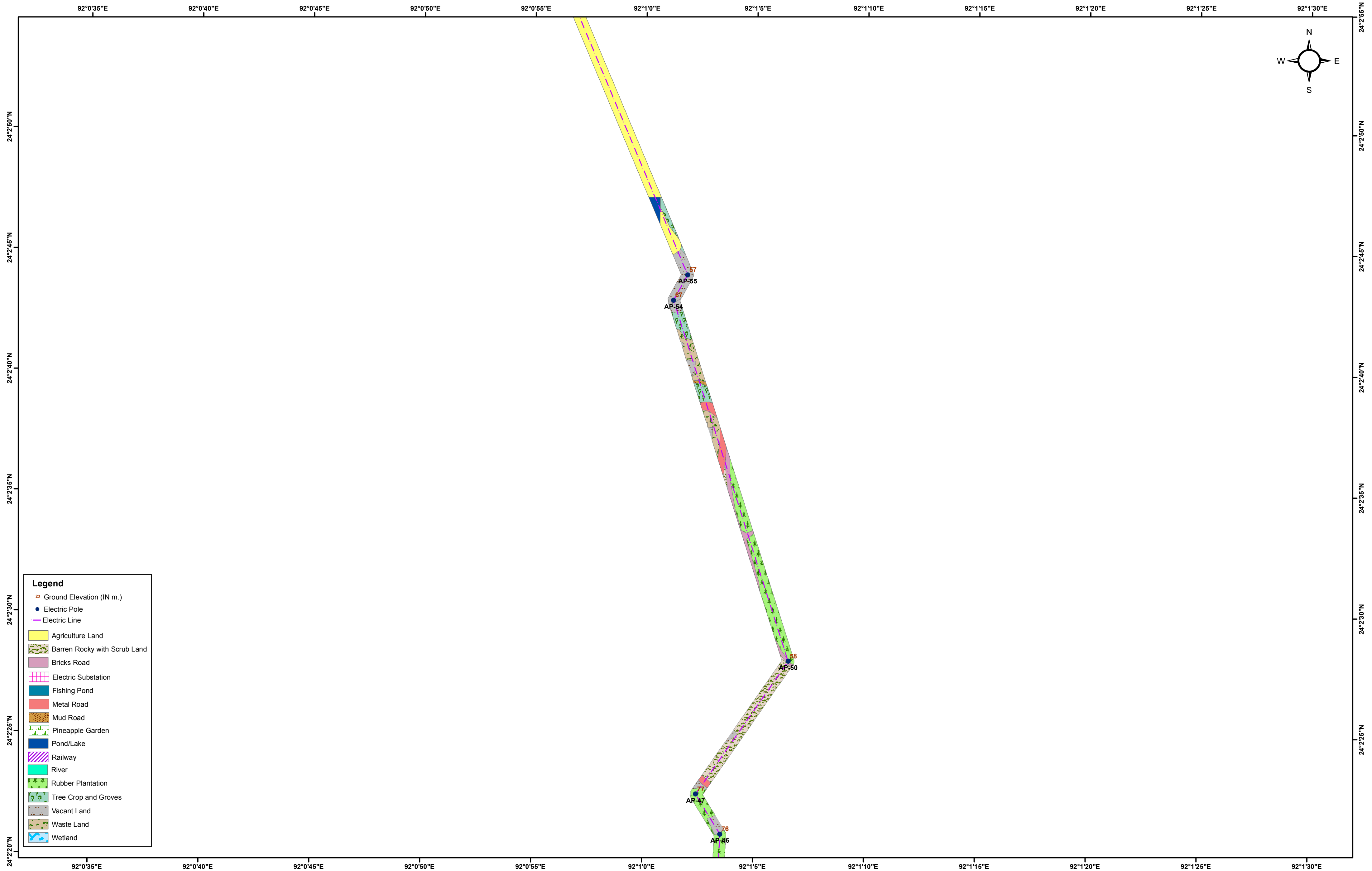
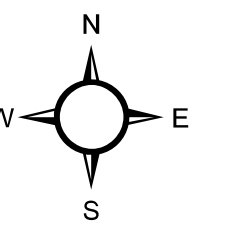


Legend

- 23 Ground Elevation (IN m.)
- Electric Pole
- Electric Line
- Agriculture Land
- Barren Rocky with Scrub Land
- Bricks Road
- Electric Substation
- Fishing Pond
- Metal Road
- Mud Road
- Pineapple Garden
- Pond/Lake
- Railway
- River
- Rubber Plantation
- Tree Crop and Groves
- Vacant Land
- Waste Land
- Wetland



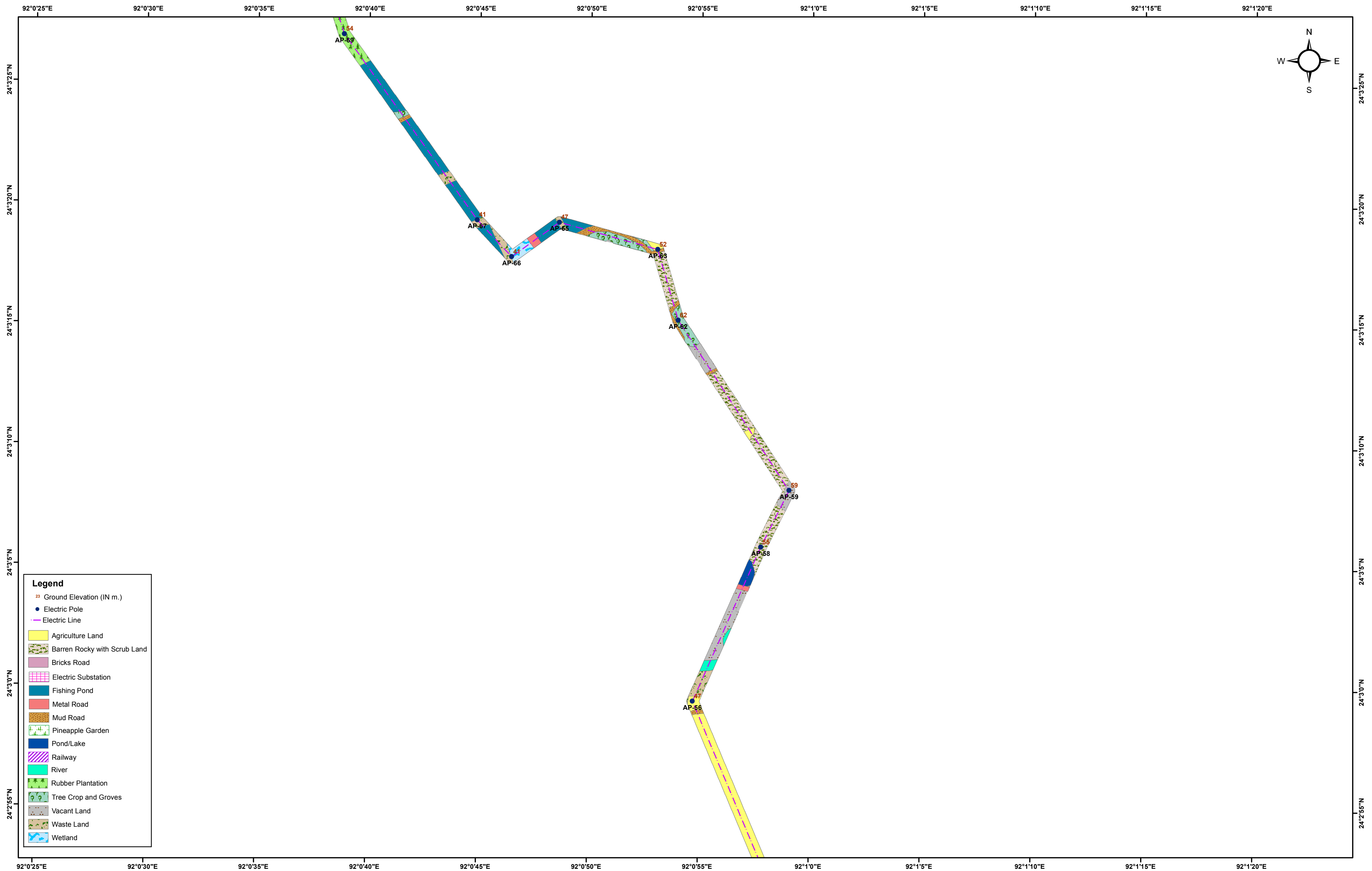
LAND USE/LAND COVER DETAILS OF MANU 132/33 KV S/S TO 82 MILE
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



Legend

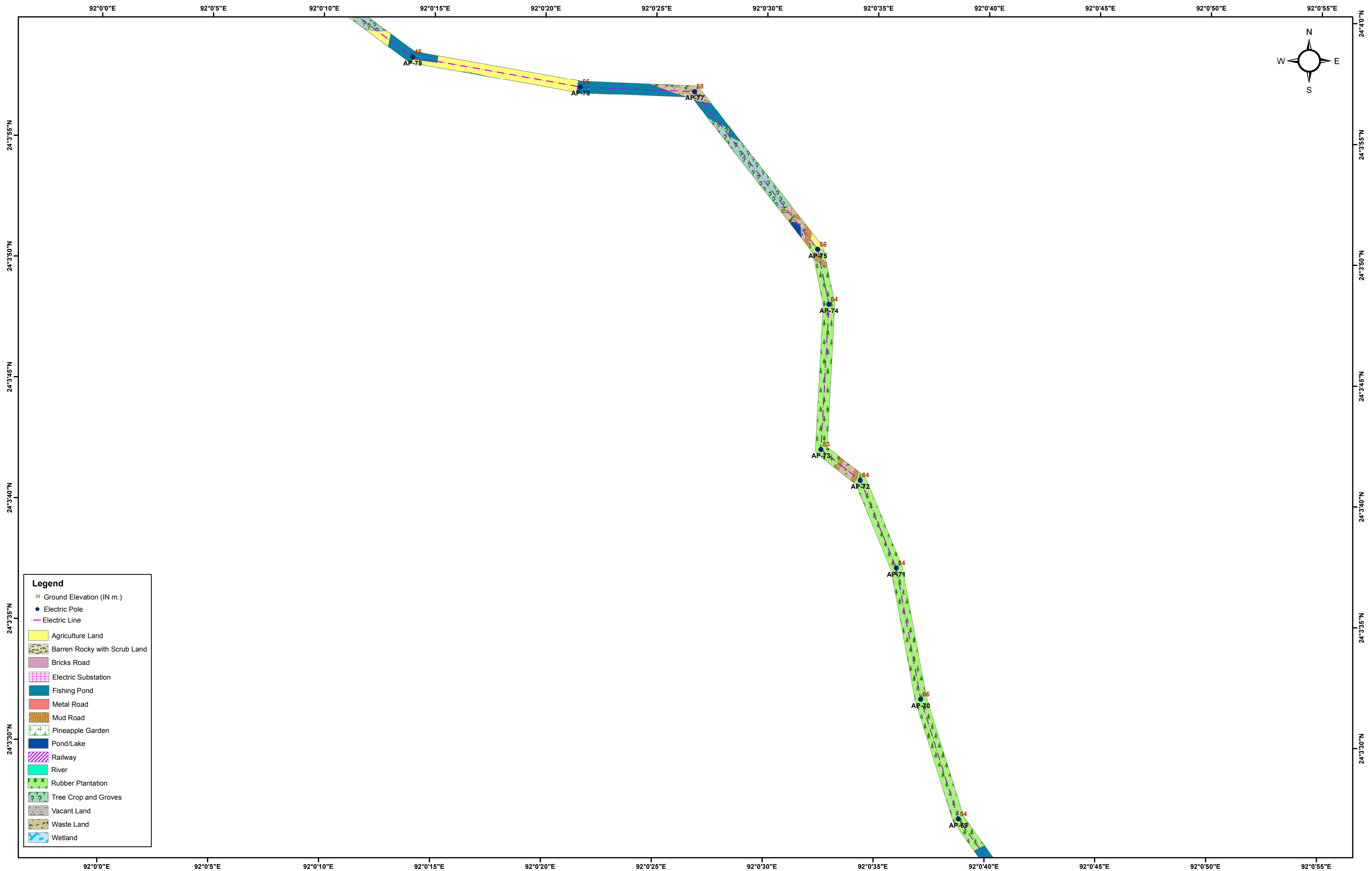
- 23 Ground Elevation (IN m.)
- Electric Pole
- Electric Line
- Agriculture Land
- Barren Rocky with Scrub Land
- Bricks Road
- Electric Substation
- Fishing Pond
- Metal Road
- Mud Road
- Pineapple Garden
- Pond/Lake
- Railway
- River
- Rubber Plantation
- Tree Crop and Groves
- Vacant Land
- Waste Land
- Wetland

LAND USE/LAND COVER DETAILS OF MANU 132/33 KV S/S TO 82 MILE
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



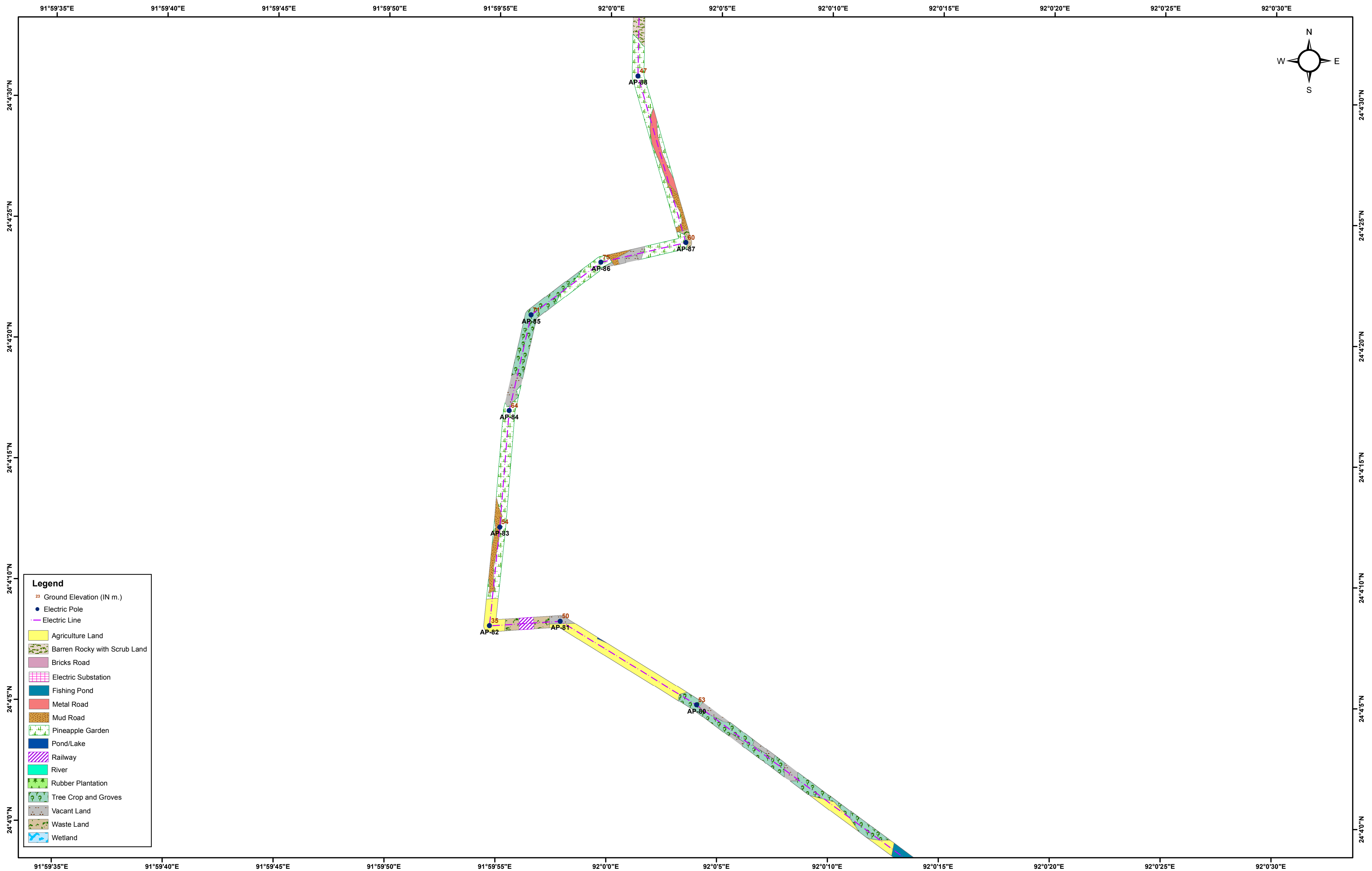
- Legend**
- 23 Ground Elevation (IN m.)
 - Electric Pole
 - Electric Line
 - Agriculture Land
 - Barren Rocky with Scrub Land
 - Bricks Road
 - Electric Substation
 - Fishing Pond
 - Metal Road
 - Mud Road
 - Pineapple Garden
 - Pond/Lake
 - Railway
 - River
 - Rubber Plantation
 - Tree Crop and Groves
 - Vacant Land
 - Waste Land
 - Wetland

LAND USE/LAND COVER DETAILS OF MANU 132/33 KV S/S TO 82 MILE
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,

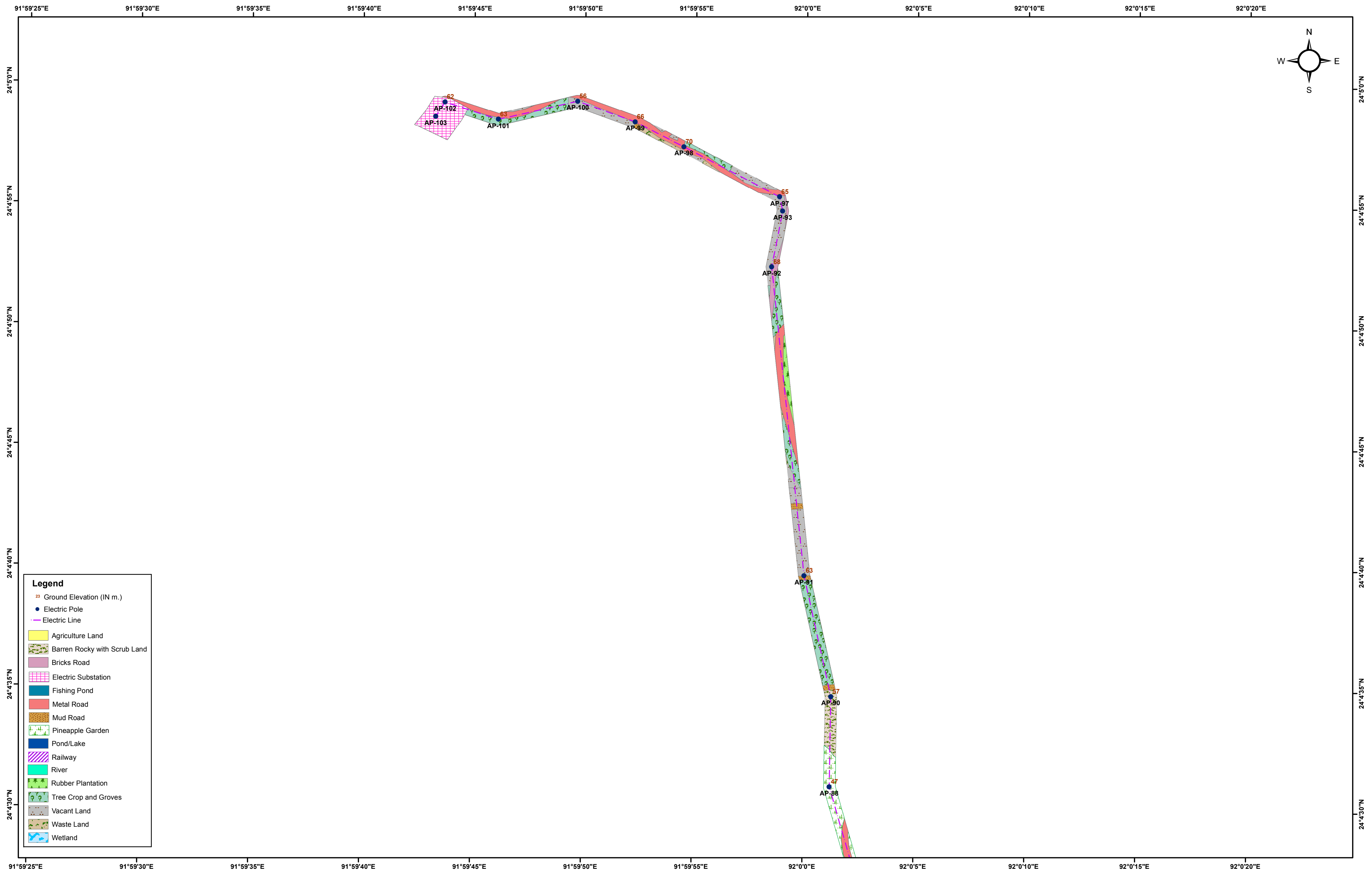


- Legend**
- 23 Ground Elevation (IN m.)
 - Electric Pole
 - Electric Line
 - Agriculture Land
 - Barren Rocky with Scrub Land
 - Bricks Road
 - Electric Substation
 - Fishing Pond
 - Metal Road
 - Mud Road
 - Pineapple Garden
 - Pond/Lake
 - Railway
 - River
 - Rubber Plantation
 - Tree Crop and Groves
 - Vacant Land
 - Waste Land
 - Wetland

LAND USE/LAND COVER DETAILS OF MANU 132/33 KV S/S TO 82 MILE
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



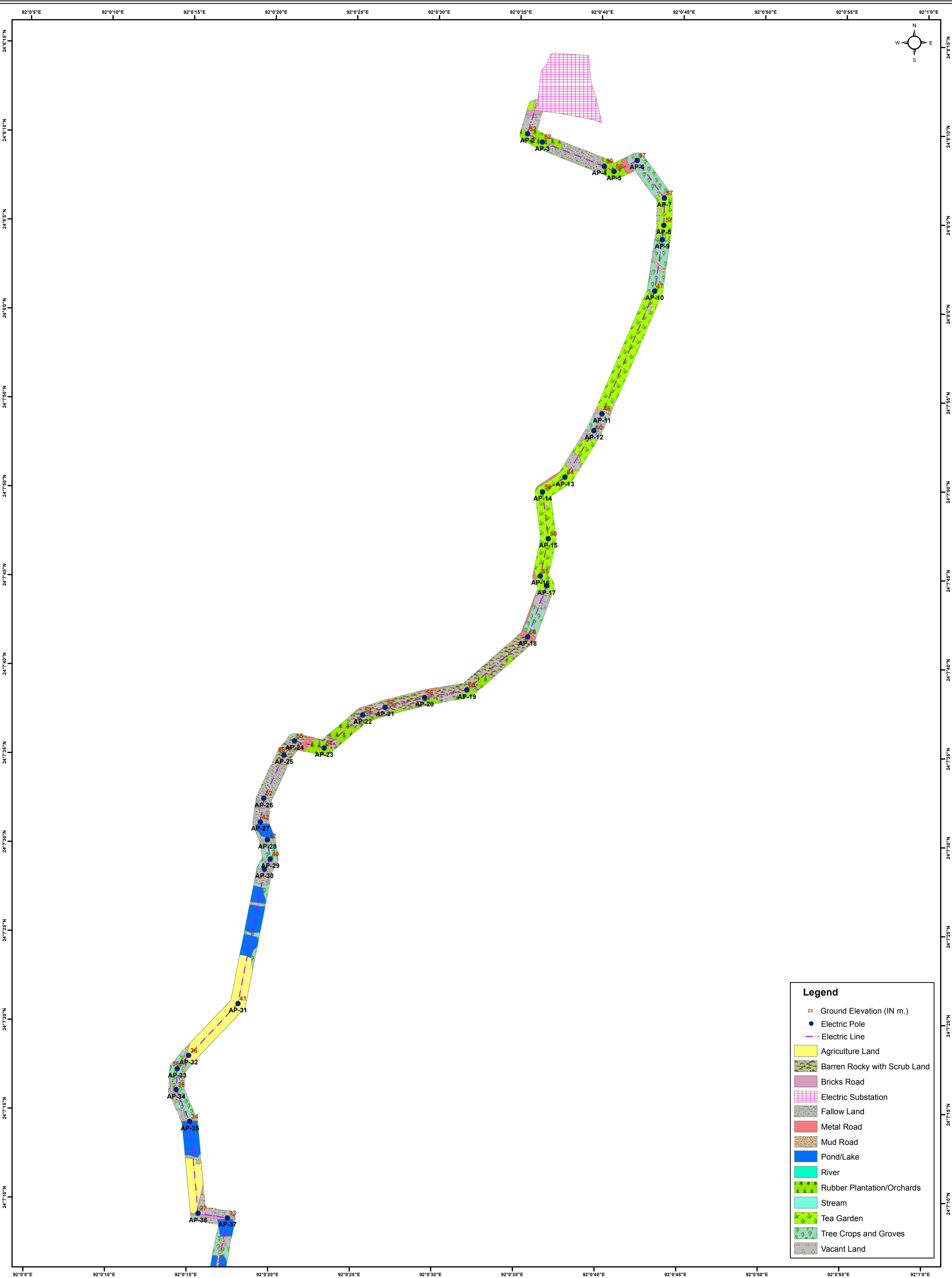
LAND USE/LAND COVER DETAILS OF MANU 132/33 KV S/S TO 82 MILE
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



Legend

- 23 Ground Elevation (IN m.)
- Electric Pole
- Electric Line
- Agriculture Land
- Barren Rocky with Scrub Land
- Bricks Road
- Electric Substation
- Fishing Pond
- Metal Road
- Mud Road
- Pineapple Garden
- Pond/Lake
- Railway
- River
- Rubber Plantation
- Tree Crop and Groves
- Vacant Land
- Waste Land
- Wetland

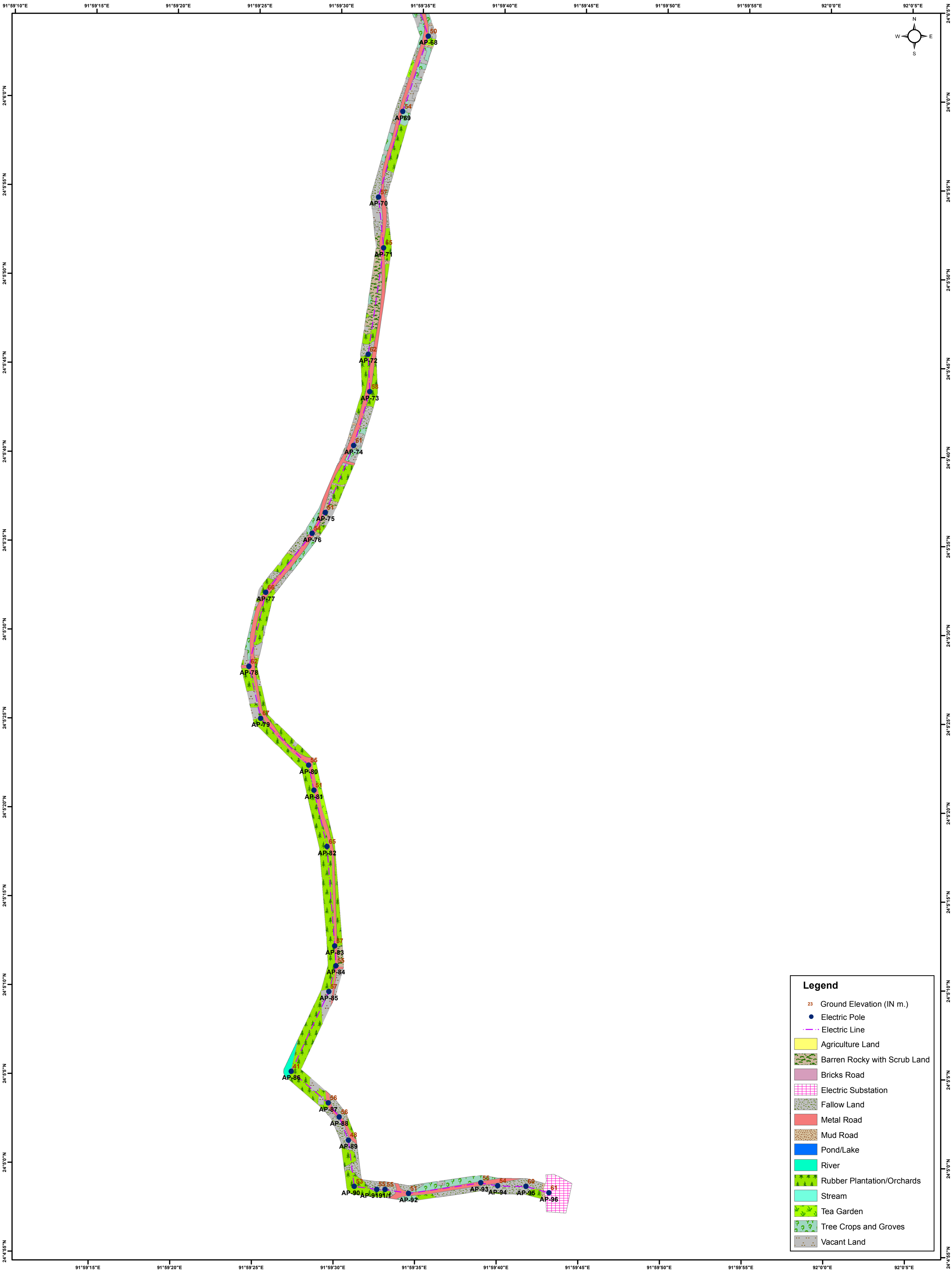
LAND USE/LAND COVER DETAILS OF PK.BARI 132/33 KV S/S TO 82 MILE
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



Legend

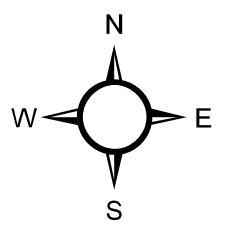
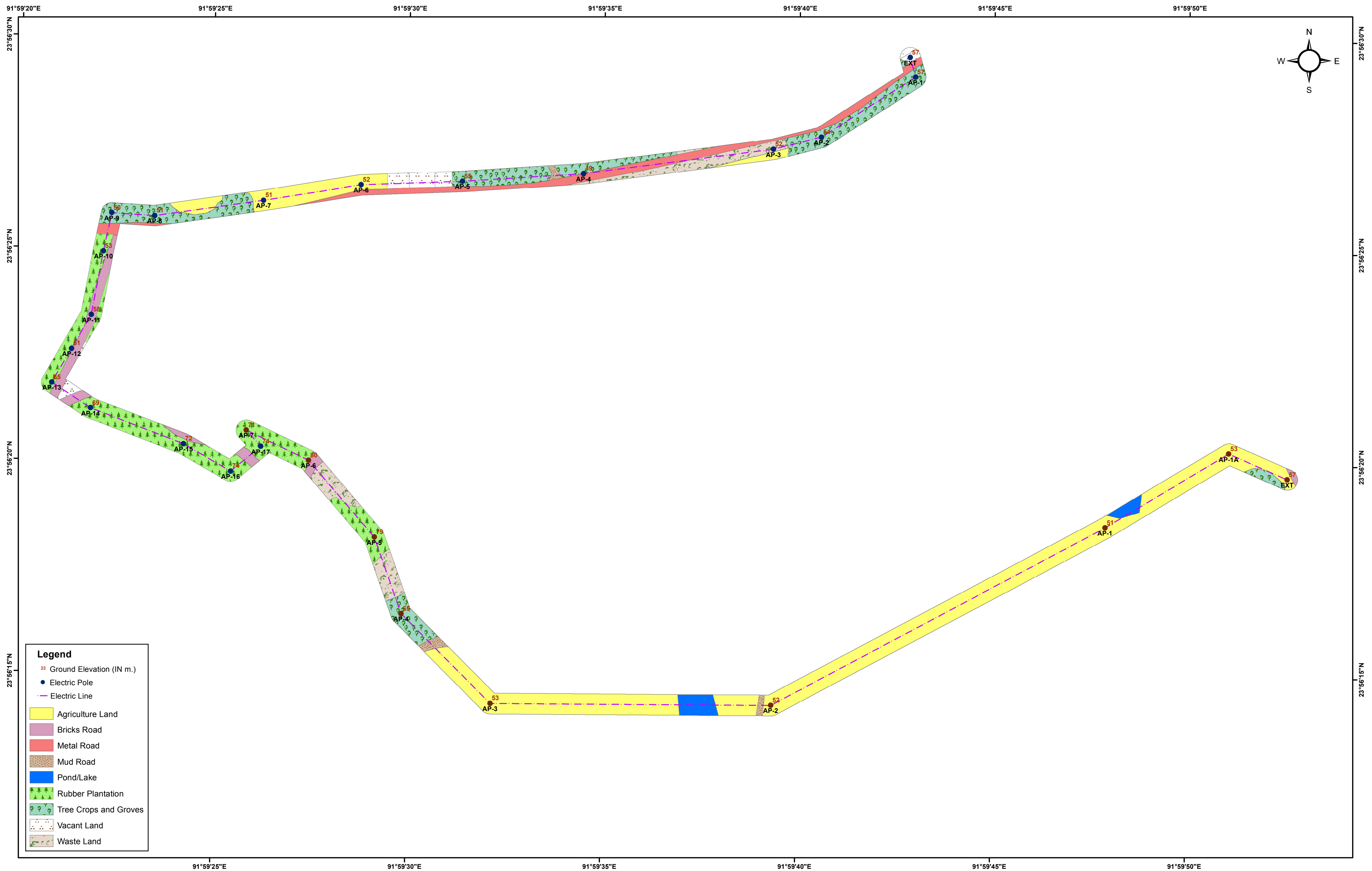
- 23 Ground Elevation (IN m.)
- Electric Pole
- Electric Line
- Agriculture Land
- Barren Rocky with Scrub Land
- Bricks Road
- Electric Substation
- Fallow Land
- Metal Road
- Mud Road
- Pond/Lake
- River
- Rubber Plantation/Orchards
- Stream
- Tea Garden
- Tree Crops and Groves
- Vacant Land

LAND USE/LAND COVER DETAILS OF PK.BARI 132/33 KV S/S TO 82 MILE
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



Legend	
23	Ground Elevation (IN m.)
●	Electric Pole
---	Electric Line
■	Agriculture Land
■	Barren Rocky with Scrub Land
■	Bricks Road
■	Electric Substation
■	Fallow Land
■	Metal Road
■	Mud Road
■	Pond/Lake
■	River
■	Rubber Plantation/Orchards
■	Stream
■	Tea Garden
■	Tree Crops and Groves
■	Vacant Land

LAND USE/LAND COVER DETAILS OF LILO OF EXISTING CHHAMNU-MANU LINE AT CHAI LENGTA (LOOP IN)
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED
PREPARED BY GREEN CIRCLE INC,



Legend

- Ground Elevation (IN m.)
- Electric Pole
- Electric Line
- Agriculture Land
- Bricks Road
- Metal Road
- Mud Road
- Pond/Lake
- Rubber Plantation
- Tree Crops and Groves
- Vacant Land
- Waste Land

Annexure B1

AP_No	Ground Elevation Of EP	EP Fall in Feature	Rock_Type	Rock_Type2	Landslide Study	Flood Study	Hazard Type
AP-1	39	Vacant Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	None	Earthquake, Wind Storm
AP-2	62	Open Hill Forest	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	None	None	Earthquake, Wind Storm
AP-3	38	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-4	51	Open Hill Forest	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-5	63	Open Hill Forest	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-6	53	Rubber Plantation	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-7	46	Rubber Plantation	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-8	50	Barren/Rocky	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-9	142	Rubber Plantation	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-10	204	Open Hill Forest	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-11	155	Open Hill Forest	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-12	105	Open Hill Forest	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-13	85	Open Hill Forest	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-14	90	Open Hill Forest	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-15	69	Barren/Rocky	Shale with sandstone/ limestone bands	Structural Hills-Moderately dissected	High Landslide	None	Earthquake, Wind Storm and High Landslide
AP-16	38	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇô Shallow	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-17	39	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇô Shallow	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-18	33	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇô Shallow	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-19	27	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇô Shallow	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-20	37	Agriculture Land	Shaly Sandstone	Structural Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-21	35	Rubber Plantation	Shaly Sandstone	Structural Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-22	28	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	None	Earthquake, Wind Storm
AP-23	37	Rubber Plantation	Shaly Sandstone	Structural Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-24	34	Agriculture Land	Shaly Sandstone	Valley Fill -éřÇô Shallow	None	None	Earthquake, Wind Storm
AP-25	28	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-26	23	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-27	25	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-27A	25	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-28	18	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-29	18	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-29A	21	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-30	18	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-31	23	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-31A	17	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-31B	19	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-32	16	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-33	24	Agriculture Land	Shaly Sandstone	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-34	16	Agriculture Land	Shaly Sandstone	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-35	21	Agriculture Land	Shaly Sandstone	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-36	22	Agriculture Land	Shaly Sandstone	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-37	23	Agriculture Land	Shaly Sandstone	Valley Fill -éřÇôModerate	None	Flood Prone Area	Earthquake, Wind Storm and Flood
AP-38	23	Agriculture Land	Shaly Sandstone	Valley Fill -éřÇôModerate	None	None	Earthquake, Wind Storm
AP-39	30	Tree Crop and Groves	Shaly Sandstone	Structural Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-40	31	Tree Crop and Groves	Shaly Sandstone	Structural Hills-Less dissected	None	None	Earthquake, Wind Storm

Annexure B2

LOC_NO	Ground Elevation Of EP	EP Fall in Feature	Rock_Type	Rock_Type2	Landslide Study	Flood Study	Hazard Type
1/0	75	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Moderate Landslide	None	Earthquake and Landslide
2/0	75	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Moderate Landslide	None	Earthquake and Landslide
3/0	83	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Moderate Landslide	None	Earthquake and Landslide
4/0	77	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Moderate Landslide	None	Earthquake and Landslide
GANRTY	78	Waste Land	Shaly Sandstone	Denudational Hills-Less dissected	Moderate Landslide	None	Earthquake and Landslide

AP-102	80	Tree Crop and Groves	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	Low Landslide	None	Earthquake, Wind storm and Landslide
AP-103	84	Electric Substation	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	Low Landslide	None	Earthquake, Wind storm and Landslide
AP-104	84		Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	Low Landslide	None	Earthquake, Wind storm and Landslide

Annexure B4

AP_No	Ground Elevation Of EP	EP Fall in Feature	Rock_Type	Rock_Type2	Landslide Study	Flood Study	Hazard Type
AP-1	61	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-2	63	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-3	75	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-4	75	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-5	85	Mud Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-6	85	Mud Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-7	78	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-8	75	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-9	69	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-9	74	Metal Road	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-11	68	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-12	63	Metal Road	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-13	69	Metal Road	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-14	77	Metal Road	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-15	80	Metal Road	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-16	78	Waste Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-17	70	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-18	61	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-19	57	Agriculture Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-20	55	Agriculture Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-21	46	Agriculture Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-22	46	Agriculture Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-23	55	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-24	57	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-25	47	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-26	52	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and Low Landslide
AP-27	67	Mud Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-28	66	Mud Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-29	69	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-30	65	Mud Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-31	47	Bareen/Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-32	47	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	None	Earthquake, Wind Storm
AP-33	45	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	None	Earthquake, Wind Storm
AP-34	43	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	None	Earthquake, Wind Storm
AP-35	42	Mud Road	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	None	Earthquake, Wind Storm
AP-36	53	Metal Road	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	None	Earthquake, Wind Storm
AP-37	52	Metal Road	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	None	Earthquake, Wind Storm
AP-38	53	Metal Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-39	53	Metal Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-40	57	Metal Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-41	54	Tree Crop and Groves	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm

Annexure B5

AP_No	Ground Elevation Of EP	EP Fall in Feature	Rock_Type	Rock_Type2	Landslide Study	Flood Study	Hazard Type
AP-5	70	Barren Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-6	72	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-7	76	Barren Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-8	67	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-9	77	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-10	74	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-11	77	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-12	75	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-15	79	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-16	71	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-17	68	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-19	85	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-20	49	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Low Flood	Earthquake, Wind Storm and Flood
AP-23	43	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Low Flood	Earthquake, Wind Storm and Flood
AP-24	48	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Low Flood	Earthquake, Wind Storm and Flood
AP-25	40	Tree Crop and Groves	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Low Flood	Earthquake, Wind Storm and Flood
AP-29	61	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-30	54	Mud Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-31	54	Mud Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-32	58	Bricks Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-33	60	Waste Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-34	60	Tree Crop and Groves	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-35	67	Barren Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-39	60	Agriculture Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-40	63	Tree Crop and Groves	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-41	82	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-42	81	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-43	78	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-44	85	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-45	83	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-46	76	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-47	77	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-50	58	Bricks Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-54	67	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-55	57	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-56	47	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	None	Earthquake, Wind Storm
AP-57	0				None	None	Earthquake, Wind Storm
AP-58	55	Barren Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-59	59	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-62	62	Tree Crop and Groves	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-63	52	Agriculture Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-65	47	Waste Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-66	41	Wetland	Shaly Sandstone	Valley Fill -éřÇô Shallow	None	None	Earthquake, Wind Storm
AP-67	41	Waste Land	Shaly Sandstone	Valley Fill -éřÇô Shallow	None	None	Earthquake, Wind Storm
AP-69	54	Rubber Plantation	Shaly Sandstone	Valley Fill -éřÇô Shallow	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-70	66	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-71	74	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-72	84	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide

AP-73	83	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-74	64	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-75	56	Rubber Plantation	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-77	58	Waste Land	Shaly Sandstone	Valley Fill -érÇô Shallow	None	None	Earthquake, Wind Storm
AP-78	55	Fishing Pond	Shaly Sandstone	Valley Fill -érÇô Shallow	None	Low Flood	Earthquake, Wind Storm and Flood
AP-79	45	Fishing Pond	Shaly Sandstone	Valley Fill -érÇô Shallow	None	Low Flood	Earthquake, Wind Storm and Flood
AP-80	53	Tree Crop and Groves	Shaly Sandstone	Valley Fill -érÇô Shallow	None	None	Earthquake, Wind Storm
AP-81	50	Vacant Land	Shaly Sandstone	Valley Fill -érÇô Shallow	None	Low Flood	Earthquake, Wind Storm and Flood
AP-82	35	Agriculture Land	Shaly Sandstone	Valley Fill -érÇô Shallow	None	Low Flood	Earthquake, Wind Storm and Flood
AP-83	54	Mud Road	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-84	64	Pineapple Garden	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-85	71	Tree Crop and Groves	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-86	75	Pineapple Garden	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-87	60	Pineapple Garden	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-88	47	Pineapple Garden	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-90	57	Barren Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-91	63	Mud Road	Shaly Sandstone	Denudational Hills-Less dissected	Low Landslide	None	Earthquake, Wind Storm and low landslide
AP-92	68	Bricks Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-93	65	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-97	65	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-98	70	Metal Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-99	66	Metal Road	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-100	56	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-101	63	Tree Crop and Groves	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-102	62	Electric Substation	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm
AP-103	63	Electric Substation	Shaly Sandstone	Denudational Hills-Less dissected	None	None	Earthquake, Wind Storm

Annexure B6

AP_NO	Ground Elevation of EP	EP Fall in Feature	Rock_Type	Rock_Type2	Landslide Study	Flood Study	Hazard Type
AP-2	52	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-3	52	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-4	59	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-5	58	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-6	57	Tree Crops and Groves	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-7	57	Tea Garden	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-8	57	Tea Garden	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-9	54	Tree Crops and Groves	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-10	47	Tree Crops and Groves	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-11	46	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-12	40	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-13	54	Tea Garden	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-14	56	Tea Garden	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-15	50	Tea Garden	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-16	55	Tea Garden	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-17	55	Tea Garden	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-18	66	Metal Road	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-19	60	Barren Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-20	56	Barren Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-21	52	Barren Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-22	53	Barren Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-23	57	Rubber Plantation/Orchards	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-24	55	Barren Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-25	56	Barren Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-26	52	Fallow Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-27	42	Fallow Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-28	42	Fallow Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-29	40	Tree Crops and Groves	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-30	40	Fallow Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-31	41	Agriculture Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	Low Flood	Earthquake, Wind Storm, low landslide
AP-32	36	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Low Flood	Earthquake, Wind Storm, Flood
AP-33	36	Tree Crops and Groves	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Low Flood	Earthquake, Wind Storm, Flood
AP-34	36	Tree Crops and Groves	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Low Flood	Earthquake, Wind Storm, Flood
AP-35	34	Pond/Lake	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Low Flood	Earthquake, Wind Storm, Flood
AP-36	27	Vacant Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Low Flood	Earthquake, Wind Storm, Flood
AP-37	33	Bricks Road	Alluvium-sand/ silt & clay alternating beds	Valley Fill -éřÇôModerate	None	Low Flood	Earthquake, Wind Storm, Flood
AP-38	30	Tree Crops and Groves	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-39	28	Tree Crops and Groves	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-40	37	Barren Rocky with Scrub Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-41	45	Tree Crops and Groves	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-42	40	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-43	43	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-44	53	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-45	49	Vacant Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-46	41	Bricks Road	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-47	37	Fallow Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide
AP-48	45	Fallow Land	Shaly Sandstone	Denudational Hills-Less dissected	Low Land Slide	None	Earthquake, Wind Storm, low landslide

Annexure B7

AP_No	Ground Elevation Of EP	EP Fall in Feature	Rock_Type	Rock_Type2	Landslide Study	Flood Study	Hazard Type	
EXT	57	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	Moderate Flood Prone Area	Wind Storm and Flood
AP-1A	53	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	Moderate Flood Prone Area	Wind Storm and Flood
AP-1	51	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	Moderate Flood Prone Area	Wind Storm and Flood
AP-2	52	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	Moderate Flood Prone Area	Wind Storm and Flood
AP-3	53	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	Moderate Flood Prone Area	Wind Storm and Flood
AP-4	65	Tree Crops and Groves	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
AP-5	79	Rubber Plantation	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
AP-6	80	Rubber Plantation	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
AP-7	71	Rubber Plantation	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
EXT	57	Vacant Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	None	Wind Storm
AP-1	57	Tree Crops and Groves	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	None	Wind Storm
AP-2	54	Tree Crops and Groves	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	Moderate Flood Prone Area	Wind Storm and Flood
AP-3	52	Waste Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	Moderate Flood Prone Area	Wind Storm and Flood
AP-4	49	Metal Road	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	Moderate Flood Prone Area	Wind Storm and Flood
AP-5	55	Tree Crops and Groves	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	None	Wind Storm
AP-6	52	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	None	Wind Storm
AP-7	51	Agriculture Land	Alluvium-sand/ silt & clay alternating beds	Valley Fill	éřÇôModerate	None	None	Wind Storm
AP-8	51	Tree Crops and Groves	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
AP-9	50	Tree Crops and Groves	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
AP-10	53	Rubber Plantation	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
AP-11	58	Bricks Road	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
AP-12	61	Rubber Plantation	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
AP-13	65	Rubber Plantation	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
AP-14	69	Rubber Plantation	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
AP-15	72	Rubber Plantation	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
AP-16	74	Rubber Plantation	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	
AP-17	74	Rubber Plantation	Sandstone/ pebble bed/ conglomerate	Structural Hills-Moderately dissected	None	None	Wind Storm	

Appendix



पावरग्रिड
POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and
North Tripura District under NERPSIP in Tripura



Appendix A

Environmental Monitoring Reports

A. Water Quality Reports:



राष्ट्रीय प्रौद्योगिकी संस्थान अगर्तला
NATIONAL INSTITUTE OF TECHNOLOGY AGARTALA
CIVIL ENGINEERING DEPARTMENT

Phone No: (0381) 2346630, 2348522

Fax No: (0381) 2346360

F.NITA/10(19-CE)/Testing/2017-18/10389-91

Date: 25/1/2018

Job No: C-150/17

To
The Engineer
Power Grid Corporation of India Ltd.
NERPSIP Office, Ramnagar-06,
3rd Crossing, Agartala-02

Subject: Report for Testing of Water for Manu Sub-Station.

References: NEAGT/NERPSIP-996A (III)/2017-18/661, Date: 07/11/17.

Sir,

With reference to the subject cited above this is to inform you that the testing of water have been conducted at Civil Engg. Lab. of NITA Agartala. The test reports are attached herewith.

For any-future dispute/ambiguity, entrusted faculty members are responsible to clarify these issues.

Thanking you.

Yours faithfully


HOD, CE Deptt.
NIT Agartala

Enclosure: Copy of Report.

Copy to:

- (1) The Chairman, Research & Consultancy for kind information.
- (2) The HOD, Civil Engg. Department.


HOD, CE Deptt.
NIT Agartala



पावरग्रिड
POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and
North Tripura District under NERPSIP in Tripura



राष्ट्रीय प्रौद्योगिकी संस्थान अगरतला
NATIONAL INSTITUTE OF TECHNOLOGY AGARTALA
CIVIL ENGINEERING DEPARTMENT

Phone No: (0381) 2346630, 2348522


Fax No: (0381) 2346360


Job No: C- 150/17

Test Result of Water (Main Sub- Station.)

References: NEAGT/NERPSIP-996A (III) 2017-18/661, Date: 07/11/17.

SL. No	Test Name	Test Results
1.	pH Value	6.7


Dr. Partha Pratim Sarkar
(Asstt. Professor, CE Deptt)


Dr. Dipankar Sarkar
(Asstt. Professor, CE Deptt.)


प्रियम दास/PRIYAM DAS
अभियंता/ENGINEER
पावरग्रिड/POWERGRID
उ.पू.खे., अगरतला/NER, Agartala.

Received S.I. No. 301
dt. 16/10/2018

REGISTERED OFFICE
507 Eros Apartments, 56 Nehru Place
New Delhi-110 019, India
Tel : +91-11-26411931, 26415961
Fax : + 91-11-26221521
Email : info@technofabengineering.com
CIN:L74210DL1971PLC005712



**TECHNOFAB
ENGINEERING LIMITED**

Letter Ref. no.: PGCIL/DMS04/Technofab/2018-19/

Date: Oct 16, 2018

To,
The Deputy General Manager,
Powergrid Corporation of India Limited
Ramnagar-6 (3rd Crossing)
Agartala 799002

Kind Attn.: Shri S. I. Singh

NOA No.: CC-CS/86-NER/REW-2987/1/G2/NOA-I&II/7147&7148 DT: Feb.27.2017 (DMS 04)

Subject: Reason for not testing of drinking water supplied to the workers & staff at all sites

Dear Sir,

This is for your kind information that, we are purchasing 20 liter package drinking Water available in the market and supplying them to all worker and staff at the site. Therefore we are not testing the drinking water which is supplied to them. We are enclosing the bills of drinking water that is supplied to all the workers and staffs.

Thank you and assuring you the best service ever.

For Technofab Engineering Limited

M K Rai
16/10/18
M K RAI
(Asth. General Manager)







Rahul Misra
for M.K.







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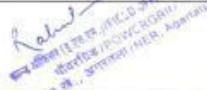
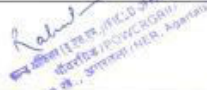
Rahul
24/10/2018

Encl.: The bills of the mineral water that is supplied to the workers and staffs in the sites.

B. Noise Monitoring

 Engineering Life C/O: Power Grid Corporation of India Limited Noise Test Report							
(132/33/11)KV Sub-Station:- SABBROOM						Month:- OCT-19	
SlNo.	Noise Reading						Remarks
Week	Area Without Machines	Total Average Reading	Area With Light Machines	Total Average Reading	Area with Heavy Machines	Total Average Reading	
1ST	-	-	-	-	-	-	This noise level observed is below from allowable maximum limit which is 90 db for 08 hrs in the working Area
	-	-	-	-	-	-	
	-	-	-	-	-	-	
2ND	-	-	-	-	-	-	
	-	-	-	-	-	-	
	-	-	-	-	-	-	
3RD	-	-	-	-	-	-	
	-	-	-	-	-	-	
	-	-	-	-	-	-	
4TH	41.06	42.01 db	54.03	53.04 db	-	-	
	42.08		52.08		-	-	
	41.09		53.01		-	-	
Reading Taken BY: RATNESH MISHRA (SPML) 			Site Incharge RABIN DAS (SPML) 			Power Grid Review 	

 Engineering Life C/O: Power Grid Corporation of India Limited Noise Test Report							
(132/33/11)KV Sub-Station:- BELONIA						Month:- SEP-19	
SlNo.	Noise Reading						Remarks
Week	Area Without Machines	Total Average Reading	Area With Light Machines	Total Average Reading	Area with Heavy Machines	Total Average Reading	
1ST	36.05	36.46 db	48.05	49. db	-	-	This noise level observed is below from allowable maximum limit which is 90 db for 08 hrs in the working Area
	36.09		48.06		-	-	
	37.05		49.09		-	-	
2ND	-	-	-	-	-	-	
	-	-	-	-	-	-	
	-	-	-	-	-	-	
3RD	-	-	-	-	-	-	
	-	-	-	-	-	-	
	-	-	-	-	-	-	
4TH	-	-	-	-	-	-	
	-	-	-	-	-	-	
	-	-	-	-	-	-	
Reading Taken BY: RATNESH MISHRA (SPML) 			Site Incharge RABIN DAS (SPML) 			Power Grid Review 	

 SPML Engineering Life							
C/O: Power Grid Corporation of India Limited							
Noise Test Report							
(132/33/10KV Sub-Station:- SATCHAND)					Month:- OCT-19		
S.No.	Noise Reading						Remarks
Week	Area Without Machines	Total Average Reading	Area With Light Machines	Total Average Reading	Area with Heavy Machines	Total Average Reading	
1ST	40.05	40.95db	52.04	51.93db	-	-	The noise level observed is below from allowable maximum limit 90db for 08 Hrs working Area.
	41.07		51.06		-		
	40.06		51.08		-		
2ND	-	-	-	-	-	-	
	-		-		-		
	-		-		-		
3RD	-	-	-	-	-	-	
	-		-		-		
	-		-		-		
4TH	39.07	39.73db	50.06	53.06db	-	-	
	39.02		54.09		-		
	40.03		52.07		-		
Reading Taken BY:			Site Incharge		Power Grid Review		
RATHESH SHUKLA [SPML]  			S. RABIN DAS [SPML]  		Rahul  		

C. Soil Taxonomic Classification of Project Districts of FEAR II

Soil Unit	Description	Taxonomic Classification	Area (in'000 ha)	Area (%)
1	Deep, somewhat excessively drained, loamy skeletal soils on very steeply sloping side slopes of high relief structural hills having loamy surface with very severe erosion hazard	Loamy skeletal Typic Dystrachrepts Fine loamy Typic Dystrachrepts	32.9	3.1
	Associated with: Deep to very deep, well drained, fine loamy soils on steeply sloping ridges with severe erosion hazard			
2	Deep to very deep, somewhat excessively drained, fine loamy skeletal soils on steeply sloping hill summits having loamy surface with severe erosion hazard	Fine loamy Typic Udorthents Fine loamy Typic Dystrachrepts	42.6	4.1
	Associated with: Deep, somewhat excessively drained, fine loamy soils on side slopes of high relief structural hill with severe erosion hazard and slight stoniness			
3	Deep, well drained, loamy skeletal soils on steeply sloping side slopes of high relief structural hills having loamy surface with very severe erosion hazard and moderate stoniness	Loamy skeletal Typic Dystrachrepts Fine loamy Typic Haplumbrepts Fragmental Lithic Udorthents	10.9	1.0
	Associated with: Deep to very deep well drained, fine loamy soils on moderately steeply sloping hill summit with severe erosion hazard and slight stoniness			
4	Deep to very deep, well drained, fine loamy soils on moderately dissected side slopes of ridges having loamy surface with severe erosion hazard	Fine loamy Typic Hapludults Fine loamy Umbric Dystrachrepts	63.1	6.0
	Associated with: Deep, somewhat excessively drained, fine loamy soils on moderately steeply sloping ridge top with moderate erosion hazard and slight stoniness			
5	Very deep, excessively drained, Coarse loamy soils on the slopes of moderately sloping medium relief having loamy surface with severe erosion hazard	Coarse loamy Typic Udorthents Loamy over sandy Typic Dystrachrepts Fine Loamy Typic Dystrachrepts	20.2	1.9
	Associated with: Deep, well drained, loamy over sandy soils on moderately sloping side slopes of the hills with moderate erosion hazard			
6	Deep, well drained, fine loamy soils on the side slopes of parallel ridges, moderately steeply sloping having loamy surface with severe erosion hazard	Fine Typic Dystrachrepts Coarse loamy over sandy Typic Udorthents Fine loamy Typic Hapludults	58.8	5.6
	Associated with: Deep, well drained, coarse loamy over sandy soils on steeply sloping side slopes of the hills with moderate erosion hazard			
7	Very deep, well drained, fine loamy soils on the moderately steeply sloping hill top having loamy surface with severe erosion hazard	Fine loamy Typic Dystrachrepts Fragmental lithic Udorthents Fine loamy Typic Haplumbrepts	39.6	3.8
	Associated with: shallow, well drained, fragmental soils very steeply sloping parallel ridges, with severe erosion hazard and severe stoniness			
8	Deep to very deep, excessively drained, fine loamy soils on the moderately sloping side slopes of medium relief parallel ridges having loamy surface with severe erosion hazard and slight stoniness	Fine loamy Typic Dystrachrepts Fine loamy Typic Haplumbrepts	23.4	2.2

Soil Unit	Description	Taxonomic Classification	Area (in'000 ha)	Area (%)
	Associated with: Deep, well drained, fine loamy soils on moderately sloping side slopes of the hills with moderate erosion hazard	Coarse loamy Typic Udorthents		
9	Deep, somewhat excessively drained, fine loamy soils on the steeply sloping hill top having loamy surface with severe erosion hazard	Fine loamy Typic Dystrochrepts Coarse loamy Typic Udorthents	10.2	1.0
	Associated with: moderately Deep, excessively drained, coarse loamy soils on steeply sloping side slopes of the hills with severe erosion hazard and slight stoniness	Fine loamy Typic Hapludults		
10	Deep to very deep, well drained, fine loamy soils on the moderately steeply sloping hill top having loamy surface with moderate erosion hazard	Fine Typic Dystrochrepts Fine loamy Typic Dystrochrepts	31.2	3.0
	Associated with: Deep, well drained, fine loamy soils on gently sloping side slopes with moderate erosion hazard	Fine loamy Typic Paleudults		
11	Very deep, somewhat excessively drained, coarse loamy soils on moderately steeply sloping hill slopes having loamy surface with severe erosion hazard	Fine loamy Typic Udorthents Fine Loamy Typic Haplumbrepts	3.6	0.4
	Associated with: very Deep, well drained, fine loamy soils on moderately sloping hill top with moderate erosion hazard	Fine Loamy Umbric Dystrochrepts		
12	Very deep, well drained, loamy skeletal soils on the steeply sloping sides of ridges having loamy surface with moderate erosion hazard and moderate stoniness	Loamy skeletal Umbric Dystrochrepts Fine loamy Typic Dystrochrepts	24.4	2.3
	Associated with: Deep, well drained, fine loamy soils moderately sloping sides slopes with moderate erosion hazard			
13	Moderately Deep, somewhat excessively drained, coarse loamy soils on the moderately steeply sloping side slopes of ridges having loamy surface with severe erosion hazard	Coarse loamy Typic Udorthents Fine loamy Umbric Dystrochrepts	16.5	1.6
	Associated with: Deep, well drained, fine loamy soils on moderately sloping hill tops with moderate erosion hazard	Fine loamy Typic Dystrochrepts		
14	Deep to very deep, well drained, fine loamy soils on the moderately steeply sloping side slopes of low relief hills having loamy surface with severe erosion hazard	Fine Typic Dystrochrepts Coarse loamy Typic Udorthents	0.7	0.1
	Associated with: Deep, somewhat excessively drained, coarse loamy soils on moderately sloping ridge tops with severe erosion hazard	Fine Loamy Umbric Dystrochrepts		
15	Deep, well drained, fine loamy soils on moderately sloping flat topped denudation hills having clay loam surface with moderate erosion hazard	Fine loamy Typic Kandiudalts Fine loamy Typic Dystrochrepts	51.7	5.0
	Associated with: Deep, well drained, fine loamy soils on gently sloping flat topped denudation hills having clay loam surface with moderate erosion hazard	Fine Loamy Umbric Dystrochrepts		
16	Deep, well drained, fine loamy soils on moderately to gently sloping flat topped denudation hills having clay loam surface with moderate erosion hazard	Fine loamy Typic Kandiudalts Fine loamy	25.4	2.4

Soil Unit	Description	Taxonomic Classification	Area (in'000 ha)	Area (%)
	Associated with: Deep, imperfectly drained, fine loamy soils on gently sloping hill top with moderate erosion hazard	Aquic Dystrachrepts Fine Typic Dystrachrepts		
17	Deep, well drained, coarse loamy soils on gently sloping low-lying residual hills having sandy loam surface with moderate erosion hazard	Coarse loamy Typic Dystrachrepts Fine loamy	7.9	0.8
	Associated with: very Deep, well drained, fine loamy soils on moderately sloping low-lying residual hills with moderate erosion hazard	Typic Hapludults Clay Loamy Skeletal typic Dystrachrepts		
18	Deep, well drained, fine loamy soils on moderately sloping low-lying residual hills having clay loamy surface with moderate erosion hazard	Fine loamy Typic Dystrachrepts Coarse loamy	4.8	0.5
	Associated with: very Deep, imperfectly drained, coarse loamy soils on gently sloping narrow interhall basin under poor to moderate cultivation of paddy	Aquic Udorthents Fine Loamy Aquic Dystrachrepts		
19	Deep, moderately well drained, fine loamy soils on gently to moderately sloping undulating plains with low mounds having clay loam surface with moderate erosion hazard	Fine loamy Typic Dystrachrepts Fine loamy Typic Epiaquepts Coarse loamy Typic Dystrachrepts	39.2	3.7
	Associated with: moderately shallow, poorly to imperfectly drained, fine loamy soils on very gently sloping narrow valleys with slight flooding hazard and slight erosion hazard			
20	Deep, well drained, fine loamy soils on gently to moderately sloping undulating plains with low mounds having loamy surface with moderate erosion hazard	Fine Typic Dystrachrepts Coarse loamy over sandy Typic Dystrachrepts Fine loamy Typic Hapludults	6.0	0.6
	Associated with: very deep, well drained, coarse loamy over sandy soils on side slopes of moderately sloping low mounds with moderate erosion hazard			
21	Deep, moderately well drained, fine loamy soils on gently sloping undulating plains with low mounds having loamy surface with moderate erosion hazard	Fine loamy Typic Dystrachrepts Fine Loamy Aquic Dystrachrepts Fine Loamy Oxyaquic Dystrachrepts	130.0	12.4
	Associated with: deep to very deep, poorly or imperfectly drained, fine loamy soils with slight erosion hazard			
22	Deep, moderately well drained, fine loamy soils on gently to moderately sloping undulating plains with low mounds having loamy surface with moderate erosion hazard	Fine loamy Typic Dystrachrepts Fine Loamy Oxyaquic Dystrachrepts Course Loamy Typic Udorthents	12.0	1.0
	Associated with: Deep to very deep, imperfectly drained, fine loamy soils with slight erosion hazard			
23	Moderately deep, well drained, fine loamy soils on moderately sloping undulating plains with low mounds having loamy surface with moderate erosion hazard	Fine loamy Typic Kandiodalts Fine silty over sandy loamy	9.0	0.8
	Associated with: Deep to very deep, imperfectly to poorly drained, fine silty over sandy soils with slight erosion hazard	Aquic Dystrachrepts Course Loamy Typic Udorthents		
24	Very Deep, well drained, fine loamy soils on gently sloping low lands having loamy surface with moderate erosion hazard	Fine Loamy Oxyaquic Dystrachrepts Fine Loamy Aquic Udorthents	1.9	0.2
	Associated with: very deep, poorly drained, fine loamy soils with slight erosion hazard			

Soil Unit	Description	Taxonomic Classification	Area (in'000 ha)	Area (%)
25	Very Deep, moderately well drained, fine loamy soils on gently sloping low mounds having loamy surface with moderate erosion hazard	Fine loamy Typic Kandiodalts	3.5	0.3
	Associated with: very deep, poorly drained, fine loamy soils on gently sloping low mounds with moderate erosion hazard	Fine loamy Umbric Dystrochrepts Fine Loamy Typic Udorthents		
26	Deep, moderately well drained, clayey soils on upland of gently to very gently sloping interhall valleys having fine loamy surface with moderate to slight erosion hazard	Fine Typic Dystrochrepts Fine Loamy Aquic Dystrochrepts	26.6	2.5
	Associated with: very deep, imperfectly drained, fine loamy soils on very gently sloping narrow interhall valleys with slight erosion hazard	Fine Loamy Typic Epiaquepts		
27	Very Deep, well drained, fine loamy soils on the upland of gently to very gently sloping interhill valleys having clay loamy surface with moderate erosion hazard	Fine loamy Typic Haplumbrepts Fine Loamy Dystrochrepts	19.2	1.8
	Associated with: very deep, well drained, fine loamy soils on gently sloping interhill valleys with moderate erosion hazard			
28	Deep, well drained, fine loamy soils on upland of gently to very gently sloping interhill valleys having coarse loamy surface with moderate to slight erosion hazard	Fine loamy Fluventic Umbric Haplumbrepts Fine silty Epiaquepts	8.3	0.8
	Associated with: very deep, poorly drained, fine silty soils on very gently sloping narrow interhill valleys with occasional flooding hazard and slight erosion hazard			
29	Deep, well drained, fine loamy soils on upland of gently to very gently sloping interhall valleys having fine loamy surface with moderate erosion hazard	Fine loamy Typic Dystrochrepts Coarse loamy Typic Dystrochrepts	86.2	8.2
	Associated with: very deep, well drained, coarse loamy soils on the upland of gently sloping interhill with moderate erosion hazard	Fine loamy Typic Hapludalts		
30	Deep, well drained, fine loamy soils on upland of gently to very gently sloping interhill valleys having clay loam surface with moderate erosion hazard	Fine loamy Typic Dystrochrepts Coarse loamy Typic Dystrochrepts	6.8	0.7
	Associated with: very deep, well drained, coarse loamy soils on the gently sloping interhill valleys with moderate erosion hazard	Coarse loamy Typic Udorthents		
31	Deep, well drained, fine loamy soils on upland of gently to very gently sloping interhill valleys having clay loam surface with moderate erosion hazard	Fine loamy Typic Dystrochrepts Coarse loamy Typic Dystrochrepts	10.4	1.0
	Associated with: very deep, well drained, coarse loamy soils on the gently sloping interhill valleys with moderate erosion hazard	Coarse loamy Typic Hapludalts		
32	Deep, poorly to imperfectly drained, coarse loamy soils on gently to very gently sloping interhill valleys having sandy loam surface with moderate erosion hazard	Coarse loamy Aquic Udorthents Fine loamy Typic Dystrochrepts	1.5	0.1
	Associated with: very deep, well drained, clayey soils on the upland of gently sloping interhill valleys with moderate erosion hazard			
33	Deep, imperfectly drained, coarse loamy soils on gently to moderately gently sloping interhill valleys	Fine loamy Aeric Dystrochrepts	1.0	0.1

Soil Unit	Description	Taxonomic Classification	Area (in'000 ha)	Area (%)
	having sandy loam surface with moderate erosion hazard and occasional flooding hazard	Fine loamy Aquic Dystrochrepts		
	Associated with: very deep, poorly drained, fine loamy soils on gently sloping interhill valleys with slight erosion hazard and occasional flooding hazard			
34	Moderately Deep, imperfectly drained, fine loamy soils on gently sloping interhill valleys having clay loam surface with slight erosion hazard and occasional flooding hazard	Fine loamy Aquic Dystrochrepts Coarse loamy Fluventic Dystrochrepts	7.4	0.7
	Associated with: very deep, moderately well drained, coarse loamy soils on gently sloping interhill valleys with slight erosion hazard and occasional flooding hazard			
35	Deep, imperfectly to poorly drained, fine loamy soils on very gently sloping alluvial plain having loamy surface with moderate to severe flooding hazard and slight erosion hazard	Fine Aeric Epiaquepts Fine Loamy Typic Epiaquepts	12.1	1.1
	Associated with: very deep, very poorly drained, fine loamy soils on gently sloping alluvial plain having loamy surface with moderate to severe flooding hazard			
36	Deep, imperfectly to poorly drained, fine loamy soils on very gently sloping alluvial plain having loamy surface with moderate to severe flooding hazard and slight erosion hazard	Fine Aeric Epiaquepts Fine Loamy Typic Epiaquepts Sandy Over Loamy Typic Epiaquepts	29.7	2.8
	Associated with: very deep, very poorly drained, fine loamy soils on gently sloping alluvial plain having loamy surface with moderate to severe flooding hazard			
37	Very Deep, imperfectly drained, clayey soils developed on very gently sloping alluvial plain having silty clay surface with moderate flooding hazard and slight erosion hazard	Fine loamy Aquic Dystrochrepts Fine Typic Epiaquepts	1.9	0.2
	Associated with: very deep, very poorly drained, clayey soils on very gently sloping alluvial plain with moderate flood hazard			
38	Very Deep, imperfectly drained, coarse loamy developed on gently sloping alluvial plain having sandy loam surface with occasional flooding hazard and slight erosion hazard	Coarse Loamy Aeric Epiaquepts Fine Loamy Aquic Dystrochrepts Typic Udipsamments	1.0	0.1
	Associated with: very deep, imperfectly drained, fine loamy soils on gently sloping alluvial plain with occasional flooding hazard			
39	Deep, very poorly drained, clayey soils on gently sloping floodplain having silty clay surface with severe to very severe flooding hazard and slight erosion hazard	Fine Loamy Typic Epiaquepts Fine Loamy over Sandy Typic Epiaquepts	13.2	1.2
	Associated with: very deep, imperfectly drained, fine silty soils on very gently sloping flood plain with severe to very severe flooding hazard and slight erosion hazard			
40	Very Deep, very poorly drained, clayey soils on very gently sloping floodplain having clay loam surface with severe flooding hazard and very slight erosion hazard	Fine Typic Epiaquepts Fine Loamy Typic Epiaquepts	32.6	3.1

Soil Unit	Description	Taxonomic Classification	Area (in'000 ha)	Area (%)
	Associated with: very deep, poorly to very poorly drained, fine loamy soils	Coarse loamy over Sandy Typic Fluvaquentic Dystrochrepts		
41	Very Deep, moderately well to imperfectly drained, fine loamy soils on very gently sloping floodplain having clay loam surface with moderate flooding hazard and very slight erosion hazard	Fine Aquic Dystrochrepts Fine Oxyaquic Dystrochrepts	72.9	7.0
	Associated with: very deep, moderately well drained, clayey soils on very gently sloping flood plain with occasional flooding hazard	Fine Aquic Dystrochrepts		
42	Very peep, poorly to very poorly drained, fine loamy soils on very gently sloping floodplain having clay loam surface with moderate to severe flooding hazard and very slight erosion hazard	Fine Typic Epiaquepts Fine Loamy Aeric Epiaquepts	35.9	3.5
	Associated with: very deep, poorly drained, fine loamy soils on very gently sloping flood plain with moderate to very severe flooding hazard and slight erosion hazard			
43	Very Deep, moderately well to imperfectly drained, fine loamy soils on very gently sloping floodplain having clay loam surface with moderate flooding hazard and very slight erosion hazard	Fine loamy Typic Haplumbrepts Fine Loamy Pachic Haplumbrepts	7.5	0.8
	Associated with: very deep, moderately well drained, clayey soils on very gently sloping flood plain with occasional flooding hazard	Fine Typic Dystrochrepts		

D. Flora of Project Area

Sr. No.	Name of plant	Family	Conservation status IUCN (2020.1)
1.	<i>Tectona grandis</i>	Lamiaceae	Least Concern
2.	<i>Mangifera indica</i>	Anacardiaceae	Least Concern
3.	<i>Ficus racemosa</i>	Moraceae	Least Concern
4.	<i>Aegle marmelos</i>	Rutaceae	Near Threatened
5.	<i>Areca catechu</i>	Arecaceae	Not Evaluated
6.	<i>Annona squamosa</i>	Annonaceae	Not Evaluated
7.	<i>Ficus religiosa</i>	Moraceae	Least Concern
8.	<i>Delonix regia</i>	Fabaceae	Least Concern
9.	<i>Prunus domestica</i>	Rosaceae	Least Concern
10.	<i>Moringa oleifera</i>	Moringaceae	Least Concern
11.	<i>Bombax ceiba</i>	Malvaceae	Least Concern
12.	<i>Cedrus deodara</i>	Pinaceae	Least Concern
13.	<i>Manilkara zapota</i>	Sapotaceae	Least Concern
14.	<i>Litchi chinensis</i>	Sapindaceae	Least Concern
15.	<i>Bambusa vulgaris</i>	Poaceae	Least Concern
16.	<i>Hevea Brasiliensis</i>	Euphorbiaceae	Least Concern
17.	<i>Albizia lebbek</i>	Fabaceae	Least Concern
18.	<i>Dillenia indica</i>	Dilleniaceae	Least Concern
19.	<i>Schleichera oleosa</i>	Sapindaceae	Least Concern
20.	<i>Acacia nilotica.</i>	Fabaceae	Least Concern
21.	<i>Gmelina arborea</i>	Lamiaceae	Least Concern
22.	<i>Neolamarckia cadamba</i>	Rubiaceae	Least Concern
23.	<i>Acacia auriculiformis.</i>	Fabaceae	Least Concern
24.	<i>Citrus indica</i>	Rutaceae	Least concern
25.	<i>Azadirachta indica</i>	Meliaceae	Least concern
26.	<i>Alstonia scholaris</i>	Apocynaceae	Least Concern
27.	<i>Mimusops elengi</i>	Sapotaceae	Least Concern
28.	<i>Callicarpa arborea</i>	Lamiaceae	Not Evaluated
29.	<i>Terminalia arjuna</i>	Combretaceae.	Least Concern
30.	<i>Cocos nucifera</i>	Arecaceae	Not Evaluated
31.	<i>Spondias pinnata</i>	Anacardiaceae	Not Evaluated
32.	<i>Tamarindus indica</i>	Fabaceae	Least Concern
33.	<i>Shorea robusta</i>	Dipterocarpaceae	Least concern
34.	<i>Artocarpus heterophyllus</i>	Moraceae	Least Concern
35.	<i>Cinnamomum glanduliferum</i>	Lauraceae	Least Concern
36.	<i>Aphanamixis polystachya</i>	Meliaceae	Least Concern
37.	<i>Actinodaphne angustifolia</i>	Lauraceae	Least Concern
38.	<i>Terminalia bellirica</i>	Combretaceae.	Least Concern
39.	<i>Bombax ceiba</i>	Bombaceae	Least Concern
40.	<i>Lagerstroemia speciosa</i>	Lythraceae	Least Concern
41.	<i>Dysoxylum binectarum</i>	Meliaceae	Least Concern
42.	<i>Michelia champaca</i>	Magnoliaceae	Least Concern
43.	<i>Aquilaria malacensis</i>	Thymelaeaceae	Least Concern
44.	<i>Holigarna caustic</i>	Anacardiaceae	Least Concern
45.	<i>Bambusa pallida</i>	Fabaceae	Least Concern
46.	<i>Syzygium cumini</i>	Myrtaceae	Least Concern
47.	<i>Phlogacanthus thrsiflorus</i>	Acanthaceae	Least Concern
48.	<i>Phrynium capitatum</i>	Marantaceae	-
49.	<i>Calamus leptospadix</i>	Arecaceae	Not known
50.	<i>Apostasia wallichii</i>	Orchidaceae	Not known
51.	<i>Zeuxine strateumatica</i>	Orchidaceae	Not known
52.	<i>Mesua ferra</i>	Calophyllaceae	Not known

Sr. No.	Name of plant	Family	Conservation status IUCN (2020.1)
53.	<i>Dysoxylum binectariferum</i>	Meliaceae	Least Concern
54.	<i>Pterospermum Acerifolia</i>	Malvaceae	Least Concern
55.	<i>Artocarpus chaplasha</i>	Moraceae	Least Concern
56.	<i>Cryptocarya amygdalina</i>	Lauraceae	Least Concern
57.	<i>Gmelina arborea</i>	Lamiaceae	Least Concern
58.	<i>Schima wallichii</i>	Theaceae	Least Concern
59.	<i>Chukrasia tabularis</i>	Meliaceae	Least Concern
60.	<i>Albizia chiensis</i>	Fabaceae	Least Concern
61.	<i>Albizia lebbek</i>	Fabaceae	Least Concern
62.	<i>Mallotus phillippensis</i>	Euphorbiaceae	Least Concern
63.	<i>Phyllanthus emblica</i>	Phyllanthaceae	Least Concern
64.	<i>Dalbergia stipulacea</i>	Fabaceae	Least Concern
65.	<i>Stephania glandulifera</i>	Menispermaceae	Least Concern
66.	<i>Osbeckia chinensis</i>	Melastomataceae	Least Concern
67.	<i>Clerodendrum viscosum</i>	Lamiaceae	Least Concern
68.	<i>Desmodium heterocarpon</i>	Fabaceae	Least Concern
69.	<i>Andrographis paniculata</i>	Acanthaceae	Not Evaluated
70.	<i>Ocimum tenuiflorum</i>	Labiatae	Least concern
71.	<i>Rawlfia serpentina</i>	Apocynaceae	Least concern
72.	<i>Holorrhoea pubescens</i>	Apocynaceae	Least concern
73.	<i>Saraca asoca</i>	Fabaceae	Least concern
74.	<i>Marsilea minuta</i>	Marsileaceae	Least Concern
75.	<i>Hydrocarpus kurzi</i>	Labiatae	Least concern
76.	<i>Oryza sativa</i>	Poaceae	Least concern
77.	<i>Lantana camara</i>	Verbenaceae	Not Evaluated

Appendix B
Public Consultation and PAP Meeting

DETAILS OF PUBLIC CONSULTATION MEETING

Public Consultation Enroute of Transmission Lines

Sr. No.	Village Name	Person Attended
1	Bari	15
2	Kailashnagar	1
3	Dharamnagar	1
4	Manu	5



Kailasahar



Bari



Manu



Dharmanagar



**पावरग्रिड
POWERGRID**

FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



DETAILS OF PUBLIC CONSULTATION MEETING (সহায়তা প্রকল্পের জনসম্মেলন)

Subject/বিষয়
Construction of 132kV D/C Kailashar – Dharmagar T/L & associated distribution lines(with financial assistance of WORLD BANK) under NERPSIP Project NERPSIP প্রকল্পের অ-প্রত্যক্ষ/নির্ধারিত ব্যয়/সহায়তা (আর্থিক সহায়তায়) 132kV ডি/সি ধর্মগার - কৈলাশহর পরিবাহী লাইন এবং সংশ্লিষ্ট বন্টন লাইন নির্মাণ
Place of Meeting/সভার স্থান
Gourmagar RD Block(BDO Office Conference Hall)(গৌরমগার গ্রাম (BDO অফিস কনফারেন্স হল))
Date of Meeting/সভার তারিখ
২৩/০২/২০০৭-৬/০৩/২০০৭
Name of the dignitary present in the meeting/ সভায় উপস্থিত কর্মসূচী পূর্ণ ব্যক্তিবর্গের নাম
A. Tripura Government/ ত্রিপুরা সরকার 1. Sh. Anupam Chakraborty, BDO, Gourmagar Block. 2. Mr. Sansi Singa, Chairman, Gourmagar Panchayat 3. Md. Inas Mia Kadhim, Vice Chairman, Gourmagar Panchayat. B. TSECL Officials/TSECL কর্মকর্তাবর্গ 1. Sh. Ratan Das, DGM, TSECL C. POWERGRID Officials/ পাওয়ার গ্রিড কর্মকর্তাবর্গ 1. Sh. Uttam Debnath, Sr. Engineer, POWERGRID 2. Sh. S. B. Dewan, Tech, POWERGRID
People present in the meeting/ সভায় উপস্থিত জনসংখ্যাবর্গ
40-50 nos. of local village and some common public (Attendance Sheet Enclosed) 40-50 জন স্থানীয় গ্রাম এবং কিছু সাধারণ নাগরিক (উপস্থিত ব্যক্তিবর্গের তালিকা)

Point addressed to the people/জানা যাবার/বোঝার উদ্দেশ্যে জানানো:
A brief of the NORTHEASTERN REGION POWER SYSTEM IMPLEMENTATION PROJECT(NERPSIP) under the world bank assistance has been deliberated at the beginning of the meeting by Sh. Rattan Das, DGM, TSECL. Importance & necessity of the project, necessity for upgradation of existing transmission & distribution network, various environment & Social issues associated with the project have been briefly discussed and appraised to the public present in the meeting. আয়োজনা করার কারণে TSECL এর ডেপুটি ডেপার্টমেন্ট ম্যানেজার শ্রী রতন দাস মহাশয় বিদ্যুৎ ব্যাংকের আর্থিক সহায়তায় উত্তর পূর্ব উত্তর ত্রিপুরা জেলায় উন্নয়নকর্মের প্রকল্প(NERPSIP) সম্বন্ধে জনসংখ্যাবর্গের উদ্দেশ্যে পরিষ্কার করা গিয়েছে। প্রকল্পের প্রয়োজনীয়তা ও প্রকার, বিদ্যুৎ পরিবাহী লাইন এবং বন্টন লাইন এর সমস্যা বৃদ্ধির প্রয়োজনীয়তা, প্রকল্পের ব্যয় বৃদ্ধি বিভিন্ন পরিবেশ ও সামাজিক বিষয়, সমস্যা সংক্রান্ত জনসংখ্যাবর্গা উদ্বেগ-করনের উপস্থিত জনসংখ্যাবর্গের উদ্দেশ্যে।
Response from Public/জানা যাবার/বোঝার উদ্দেশ্যে প্রতিক্রিয়া
Representatives from the public also responded and raised various concerns about the project. The various issues raised by public are summarised as below:- <ul style="list-style-type: none"> ✓ What about employment for local people and procedure for same? ✓ What is the width of ROW for cutting trees? How much compensation for the trees will be given and when? ✓ Will these line passes through heavily populated area/house area? জনসংখ্যাবর্গের পক্ষ থেকেও প্রতিক্রিয়া প্রতিক্রিয়া এবং প্রকল্প সম্পর্কে বিভিন্ন উদ্বেগ উপস্থিত করলেন। জনসংখ্যাবর্গ হারা উপস্থিত কিছু প্রশ্নের পূর্ণ বিবরণ নিচে সংক্ষেপে করা হলো:- <ul style="list-style-type: none"> - এই প্রকল্পের জন্য স্থানীয় মানুষ এর কর্মসংস্থান এবং নিয়োগ বিধি কি নিয়ম হবে ? - লাইন স্থানান্তরের সময় বাস বাড়ির কাটা/চাড়া/অপস কি হবে ? কখন এবং কি পরিমাণে ক্ষতিপূরণ দেওয়া হবে বাস্তবের জন্য ? - বিদ্যুৎ লাইন রুট বনজমি পূর্ণ এলাকা জম্মা কারণের ব্যয় এর উপর নিয়ন্ত্রণ করে কি করা ?



TRIPURA STATE ELECTRICITY CORPORATION LTD
(A GOVERNMENT OF TRIPURA ENTERPRISE)

Public Consultation Meeting
ATTENDANCE SHEET

NAME OF LINE: - 132kV Kailasahar to Dharmasagar Line
alongwith associated Distribution Line

Date: 15/12/2014

Venue - Gourmager Block(Kailasahar)

Sl no.	Name of the Villager	Name of Villager/Address	Work/Profession	Signature
1.	Alachin Nanda	Sornathpur	Service Member	[Signature]
2.	Manda Min	"	UPA Pradhan	[Signature]
3.	Mata Begun	"	Pradhan	[Signature]
4.	[Signature]	Jalpa G	Member	[Signature]
5.	Gurumoni Saha	"	Pradhan	[Signature]
6.	[Signature]	Jalpa	Business	[Signature]
7.	[Signature]	Rangachar	Home wife	[Signature]
8.	Sandana Nima	"	"	[Signature]
9.	Begunch Day	Kanailkum	Farmer	[Signature]
10.	Manda Begun	Kanailkum	UPA	[Signature]

TRIPURA STATE ELECTRICITY CORPORATION LTD
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Public Consultation Meeting
ATTENDANCE SHEET

NAME OF LINE: - 132kV Kailasahar to Dharmasagar Line
alongwith associated Distribution Line

Date: 15/12/2014

Venue - Gourmager Block(Kailasahar)

Sl no.	Name of the Villager	Name of Villager/Address	Work/Profession	Signature
11.	[Signature]	Kanailkum	UPA	[Signature]
12.	Mr. Ma Saha	Pulhokhara	Business	[Signature]
13.	Babuti Debbarth	Kanailkum	UPA	[Signature]
14.	[Signature]	Kanailkum	Farmer	[Signature]
15.	[Signature]	Kanailkum	"	[Signature]
16.	[Signature]	Kanailkum	Home wife	[Signature]
17.	Abdul Muzak	Kanailkum	Farmer	[Signature]
18.	Mahabul Alam	Kanailkum	Farmer	[Signature]
19.	Mr. Tahiro	Kanailkum	Farmer	[Signature]
20.	Pratul Saha	Kanailkum	Business	[Signature]



TRIPURA STATE ELECTRICITY CORPORATION LTD
(GOVERNMENT OF TRIPURA ENTERPRISE)

Public Consultation Meeting
ATTENDANCE SHEET

NAME OF LINE: - 132kV Kailasahar to Dharmanagar Line
alongwith associated Distribution Line

Date: 19/12/2014

Venue - Gourmagar Block(Kailasahar)

Sl. no.	Name of the Villager	Name of Village/Address	Work/Profession	Signature
2	Md. Kama Khan	North Dhalai	Business	[Signature]
11	Fakir Chatterjee	Trini Gp	Pradhan	[Signature]
15	Anima De (Dai)	Gourmagar	Member	[Signature]
24	Shangruti Saha	Bhanganagar G.P.	Housewife	[Signature]
25	Lat Chandra Debbarma	Chhatra Gp	Member	[Signature]
26	Monohar De	Gourmagar	Business	[Signature]
27	Manu De	Gourmagar	Business	[Signature]
28	Amik Ali	Bhanganagar	Business	[Signature]
29	Nikhil Deb	Chhatra Gp	Member	[Signature]
30	Nobin Ali	Bhanganagar	Pradhan	[Signature]

TRIPURA STATE ELECTRICITY CORPORATION LTD
(GOVERNMENT OF TRIPURA ENTERPRISE)

Public Consultation Meeting
ATTENDANCE SHEET

NAME OF LINE: - 132kV Kailasahar to Dharmanagar Line
alongwith associated Distribution Line

Date: 19/12/2014

Venue - Gourmagar Block(Kailasahar)

Sl. no.	Name of the Villager	Name of Village/Address	Work/Profession	Signature
30	Rafiq Ali	Bakur Gp	Pradhan	[Signature]
34	Bismit Ali	Gst Engineer	Member	[Signature]
33	Arjun Ali		Pradhan	[Signature]
39	Dipa Das	Chhatra Gp	Member	[Signature]



पावरग्रिड
POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



PUBLIC CONSULTATION MEETING AT GOURANAGAR BLOCK ON 19/12/2014





पावरग्रिड
POWERGRID

FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura





FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura

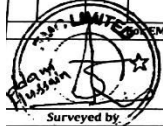


Appendix C

TOWER SCHEDULE

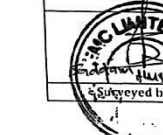
Kailasahar- Dharmanagar 132 kV D/C line - 21.916 Km

Proposed 132kV. D/C Transmission Line from Kailashahar to Darmanagar																			
Tower Schedule																			
Sl No.	AP No.	Loc. No.	Type of Tower	Angle of Deviation	Span in Metre	Cumu. Dist. (M)	Section Length	Reduce Level	Weight Span(H)			Weight Span(C)			Sum of Adjacent Span	Wind Span	Crossing Details/ Remarks	Village Name	
									Left	Right	Total	Left	Right	Total					
0	GNT	GNT	GNT		30	0		109.7	0	-122	-122	0	-220	-220	30	15	33KV.Line, Boundary Wall	Gournagar	
1	AP01	1/0	DD+00	49°23'45"	R	172	30	112.31	152	-112	40	250	-255	-5	202	101	Kancha Road, Valley, 440V.Line	Gournagar	
2	AP02	2/0	DC+00	21°3'75"	R	202	172	134	284	292	576	427	391	818	483	242	Concrete Road, 11kV Line(2Nos), 220V.Line, Pond	Gournagar	
3	AP03	3/0	DD+00	42°54'36"	L	311	513	311	106.95	19	-146	-127	-80	-326	-406	516	258	220V.Line, Brick Road	Bhabannagar
4		3/1	DB+00			205	718		136.41	328	91	419	491	61	552	471	236	Ditch	
5	AP04	4/0	DD+03	41°13'25"	R	265	984	471	140.5	175	106	281	205	86	291	531	266	UNOKOTI RESERVED FOREST	Bhabannagar
6	AP05	5/0	DD+09	32°59'00"	R	317	1249	265	139.01	159	55	214	179	-21	158	582	291	UNOKOTI RESERVED FOREST, Brick Road	Bhabannagar
7		5/1	DB+00			442	1366	317	168.99	262	303	565	338	362	700	739	380	UNOKOTI RESERVED FOREST, Cart Track, Nallah	
8	AP06	6/0	DD+00	46°52'50"	L	270	2038	442	146	139	228	367	80	295	375	712	356	Nallah, Rubber Plantation, Betelnuts Plantation	Doluchara
9		6/1	DB+00			213	2278	270	130	42	180	222	-25	234	209	483	242	Tea Garden, Ditch, Brick Road, 11 kV Line	
10		6/2	DB+06			257	2491	213	114	33	52	85	-21	-3	-24	470	235	Agricultural Land, Rubber Plantation	
11	AP07	7/0	DD+00	33°24'51"	L	464	2748	257	132.5	205	169	374	260	124	384	721	361	Tea Garden, FOREST, Betelnuts Plantation, Ditch, Rubber Plantation	Turbhani

EMC Limited

 Surveyed by

For Power Grid Corporation of India limited
 Submitted by
 Checked by
 Recommended by
 Approved by

Proposed 132kV. D/C Transmission Line from Kailashahar to Darmanagar																			
Tower Schedule																			
Sl No.	AP No.	Loc. No.	Type of Tower	Angle of Deviation	Span in Metre	Cumu. Dist. (M)	Section Length	Reduce Level	Weight Span(H)			Weight Span(C)			Sum of Adjacent Span	Wind Span	Crossing Details/ Remarks	Village Name	
									Left	Right	Total	Left	Right	Total					
65	AP30	30/0	DC+00	26°35'47"	L	222	18224	170	95.39	79	88	167	75	71	146	392	196	Nallah-3times, 220V.Line	Latugzon
66		30/1	DA+03			308	18446		95.64	134	156	290	151	157	308	530	265	Along Nallah, Brick Road,	
67	AP31	31/0	DC+03	28°09'09"	R	230	18754	530	95.34	152	118	270	151	121	272	538	269	440V. & 11KV.Line, Pucca Road	Tongibari
68		31/1	DA+03			230	18984		94.85	112	120	232	109	123	232	460	230	Nallah, Bettle Nut Plantation, 33KV.Line	
69	AP31A	31A/0	DD+03	35°45'13"	R	270	19214	460	94.18	110	153	263	107	166	273	500	250	33KV.Line, 400KV. D/C HT Line(PGCL) Under Cross	Tongibari
70	AP31B	31B/0	DD+00	29°10'33"	L	176	19484	270	94.1	117	33	150	104	-7	97	446	223	Nallah, Agricultural Land	Tongibari
71		31B/1	DA+06			257	19660		94.31	143	126	269	183	123	306	439	220	Nallah, 33KV.Line, Agricultural Land	
72		31B/2	DA+06			269	19923		95.15	137	145	282	140	137	297	520	260	33KV. & 11KV.Line, Agricultural Land	Kameshwar
73	AP32	32/0	DD+03	48°22'02"	R	269	20180	696	95.49	112	112	224	100	96	196	526	263	Pucca Rd, 11KV. & 33KV.Line, Nallah	Kameshwar
74	AP33	33/0	DD+06	41°34'18"	R	287	20449	269	96.33	157	126	283	173	113	286	556	278	33KV. & 11KV.Line, Agricultural Land	Kameshwar
75	AP34	34/0	DB+09	13°18'16"	R	286	20736	287	96.53	161	160	321	174	173	347	573	287	Nallah-3times	East Batorashi
76	AP35	35/0	DD+06	41°08'32"	L	242	21022	286	96.36	126	133	259	113	142	255	528	264	Nallah, 11KV.Line	East Batorashi
77	AP36	36/0	DD+03	52°36'00"	L	223	21264	242	97.45	109	127	236	100	138	238	465	233	Agricultural Land	Ganganagar
78	AP37	37/0	DD+00	36°28'38"	L	180	21487	223	98.28	96	99	195	85	105	190	403	202	Pond, Cart Track, 440V.Line	

EMC Limited

 Surveyed by


For Power Grid Corporation of India limited
 Submitted by
 Checked by
 Recommended by
 Approved by

**Proposed 132kV. D/C Transmission Line from Kailashahar to Dharmnagar
Detail Survey Tower Report AP-16/0 - AP-31A/0 (Length 9.829 KM)**


Sl No.	AP No.	Loc. No.	Type of Tower	Angle of Deviation	Span in Metre	Section Length	Cum. Dist. (M)	Reduce Level	Weight Span(H)			Weight Span(C)			Sum of Adjacent Span	Wind Span	Co Ordinates		Crossing Details / Remarks	Village Name	
									Left	Right	Total	Left	Right	Total			Northing	Easting			
25	24/5	DA+03			237		6773	96.77	127	122	249	125	249	497	249						
26	AP25	25/0	DB+03	10°01'53"	R	329	1510	7010	96.25	115	147	262	113	135	247	566	283	24°21'13.5"	92°09'15.3"	Agricultural Land	Radhapur
27	AP26	26/0	DD+06	55°42'09"	R	264	329	7339	96.86	182	145	327	194	155	349	593	297	24°21'19.0"	92°09'25.3"	Agricultural Land, Bamboo Thicket, Low Land	Radhapur
28		26/1	DA+03			223		7603	97.62	119	127	245	109	138	247	487	244			11KV Line, Pucca Rd	Krishnapur
29	AP27	27/0	DD+00	53°19'16"	L	280	487	7826	98.47	96	128	225	85	120	205	503	252	24°21'12.5"	92°09'43.0"	JHRI RIVER, 220V Line-2nos, Ditch	Krishnapur
30	AP27A	27A/0	DC+03	18°00'22"	L	195	280	8106	97.53	152	121	273	160	102	262	575	288	24°21'16.89"	92°09'49.58"	11KV & 220V Line, NH208A	Krishnapur
31	AP28	28/0	DD+03	46°46'42"	R	172	295	8401	96.45	174	83	256	193	80	273	467	234	24°21'23.86"	92°09'56.97"	Borrow Pit, N.E. Rivy, Electrified, Broad Gauge, Single Line, Borrow Pit	Krishnapur
32	AP29	29/0	DD+03	07°44'02"	R	196	172	8573	96.81	89	176	266	92	233	325	368	184	24°21'23.87"	92°10'03.03"	KAKRI RIVER, Pucca Rd, 11KV Line	Latugaon
33	AP29A	29A/0	DD+00	52°18'22"	L	170	196	8769	96.03	20	91	111	-37	95	58	366	183	24°21'22.99"	92°10'08.96"	Agricultural Land	Latugaon
34	AP30	30/0	DC+00	26°35'47"	L	222	170	8939	95.39	79	88	167	75	71	146	392	196	24°21'26.8"	92°10'18.1"	Nallah-3times, 220V Line	Tongbani
35		30/1	DA+03			308		9161	95.64	134	140	274	151	130	281	530	265			Along Nallah, Brick Road,	Tongbani
36	AP31	31/0	DC+06	28°09'09"	R	360	530	9469	95.34	168	171	339	178	165	343	668	334	24°21'43.1"	92°10'20.3"	Nallah, Bettle Nut Plantation, 440V. & 11KV Line, Pucca Road	Tongbani
37	AP31A	31A/0	DD+09	39°26'16"	R	360	360	8829	94.33	189	203	392	195	223	418	710	355	24°21'53.3"	92°10'32.3"		Tongbani

FOR EMC LIMITED

FOR PGCL



PREPARED BY
S. Ghosh



APPROVED BY
A. Ghosh

Field Engineer/NERPSIP
Power Grid
Kumarghat

37325

RECOMMENDED BY
SIC. PGCL
Asstt. G.M. Dhalai
Kumarghat

APPROVED BY
S. Ghosh

Approved for AP19 to AP31A
25/6/18

Approved for AP19 to AP31A
25/6/18

**Proposed 132kV. D/C Transmission Line from Kailashahar to Dharmnagar
Detail Survey Tower Report AP-16/0 - AP-31A/0 (Length 9.829 KM)**

Sl No.	AP No.	Loc. No.	Type of Tower	Angle of Deviation	Span in Metre	Section Length	Cum. Dist. (M)	Reduce Level	Weight Span(H)			Weight Span(C)			Sum of Adjacent Span	Wind Span	Co Ordinates		Crossing Details / Remarks	Village Name	
									Left	Right	Total	Left	Right	Total			Northing	Easting			
1	AP16	16/0	DD+00	36°35'49"	L	297		110.35	108	118	225	91	95	186	560	280	24°18'21.3"	92°08'37.9"	220V Line, Brick Road	Anandabazar	
2		16/1	DB+06			374		297	110.7	179	178	357	202	207	409	571	286			Agricultural Land	Rainagar
3	AP17	17/0	DD+00	38°50'52"	L	224	571	109.08	96	117	213	67	120	187	498	249	24°18'38.6"	92°08'57.6"	220V Line, Brick Road	Rainagar	
4		17/1	DA+00			235		795	108.4	107	120	227	104	121	225	459	230			Agricultural Land	Rainagar
5		17/2	DA+00			230		1030	108.1	115	115	230	114	114	228	465	233			Pucca Road, 220V Line	Rainagar
6		17/3	DA+00			259		1260	108.16	115	129	245	116	129	245	489	245			Ditch, Agricultural Land	Anandabazar
7	AP18	18/0	DD+00	31°04'44"	L	291	948	1519	108.2	130	118	247	130	97	227	550	275	24°19'03.2"	92°07'38.1"	Nallah, Teak Plantation, 220V Line	Anandabazar
8		18/1	DB+06			297		1810	107.37	173	190	363	194	220	413	588	294			Ditch, 11KV Line, Pucca Road	Rainagar
9	AP19	19/0	DC+00	28°35'31"	R	315	588	2107	105.56	107	103	210	77	63	141	612	306	24°19'22.2"	92°07'20.4"	Nallah, Agricultural Land	Rainagar
10		19/1	DB+00			274		2422	116.54	212	164	376	252	184	435	589	295			Cart Track, Ditch, Agricultural Land	Rainagar
11	AP20	20/0	DC+06	25°35'22"	R	260	589	2696	105.82	110	75	185	90	36	126	534	267	24°19'37.7"	92°07'32.4"	Ditch, Bamboo Thicket, 11KV Line, Pucca Road	Rainagar
12		20/1	DB+06			427		2956	114.88	185	224	409	224	232	456	687	344			Nallah	East Hafflong
13		20/2	DB+06			248		3383	111.94	203	139	342	195	150	345	675	338			Nallah, Agricultural Land	East Hafflong
14	AP21	21/0	DC+00	19°33'00"	L	302	935	3631	115.55	109	134	243	98	122	220	550	275	24°19'52.7"	92°08'01.5"	Cart Track, Undulation Land	East Hafflong
15		21/1	DB+00			322		3933	118.74	168	230	397	180	279	459	624	312			Nallah, Pucca Road, 11KV Line	Hafflong
16		21/2	DB+03			285		4255	101.67	92	163	256	43	178	221	607	304			Nallah, Agricultural Land	Hafflong
17		21/3	DB+00			285		4540	100.91	122	112	233	107	89	196	570	285			Ditch, Agricultural Land	East Hafflong
18	AP22	22/0	DD+06	50°35'55"	L	344	1194	4825	100.5	173	126	299	196	93	289	629	315	24°20'21.6"	92°08'29.5"	Pond, 220V Line, Pucca Road, Pond, Ditch	Hafflong
19	AP23	23/0	DD+06	47°50'44"	R	331	344	5169	110.55	218	212	430	251	246	497	675	338	24°20'32.6"	92°08'37.7"	Brick Rd, 220V Line, Ditch, Nallah	Hafflong
20	AP24	24/0	DB+06	10°07'11"	R	255	331	5500	100.67	119	136	254	85	142	226	586	293	24°20'41.0"	92°08'45.0"	Agricultural Land, Cart Track, Nallah	Radhapur
21		24/1	DA+06			258		5755	99.33	119	134	253	113	137	250	513	257			Nallah, Agricultural Land	Radhapur
22		24/2	DA+06			240		6013	98.57	124	130	255	121	137	259	498	249			Cart Track, Nallah, Bamboo Thicket, Ditch	Radhapur
23		24/3	DA+03			260		6253	100.02	110	147	257	103	159	261	500	250			Pucca Rd, Agricultural Land	Radhapur
24		24/4	DA+03			260		6513	97.25	113	133	246	101	135	236	520	260			Agricultural Land, Nallah	Radhapur

LIMITED

APPROVED BY
S. Ghosh

37325

Proposed 132kV. D/C Transmission Line from Kailashahar to Darmanagar

Tower Schedule															Crossing Details / Remarks	Village Name			
Sl No.	AP No.	Loc. No.	Type of Tower	Angle of Deviation	Span in Metre	Condu. Dist. (M)	Section Length	Reduce Level	Weight Span(H)			Weight Span(C)					Sum of Adjacent Span	Wind Span	
									Left	Right	Total	Left	Right	Total					
37	AP18	18/0	DD+00	31°30'44"	L	291	10802	948	108.2	130	118	248	130	97	227	350	275	Nallah, Teak Plantation, 220V Line	Anandabazar
38		18/1	DB+06			297	11093	291	107.37	173	190	363	194	220	414	588	294	Ditch, 11KV Line, Pucca Road	Rajnagar
39	AP19	19/0	DC+00	28°35'31"	R	315	11390	297	105.56	107	103	210	77	63	140	612	306	Nallah, Agricultural Land	Rajnagar
40		19/1	DA+00			274	11705	315	116.54	212	164	376	252	184	436	589	295	Can Track, Ditch, Agricultural Land	Rajnagar
41	AP20	20/0	DC+06	25°35'22"	R	174	11979	274	105.82	110	38	148	90	3	93	448	224	Ditch, Bamboo Thicket	Rajnagar
42		20/1	DA+00			240	12153		117.22	136	119	255	171	118	289	414	207	Pucca Road, 11KV Line, Rubber Plantation, Bamboo Thicket	
43		20/2	DA+06			275	12393		111.41	121	152	273	122	162	284	515	258	Nallah	
44		20/3	DA+03			248	12668		111.94	123	120	243	113	117	230	323	262	Pond, Rubber Plantation	
45	AP21	21/0	DC+00	19°33'00"	L	302	12916	937	115.55	128	134	262	131	122	253	550	275	Can Track, Undulation Land	East Hallong
46		21/1	DB+00			322	13218	302	118.74	168	230	398	180	279	459	624	312	Nallah, Pucca Road, 11KV Line	
47		21/2	DB+03			285	13540	322	101.67	92	163	255	43	178	221	407	244	Nallah, Agricultural Land	
48		21/3	DB+00			285	13825	285	100.91	122	112	234	107	89	196	570	285	Ditch, Agricultural Land	
49	AP22	22/0	DD+06	30°35'55"	L	344	14110	285	101.5	173	126	299	196	93	289	629	315	Pond, 220V Line, Pucca Road, Pond, Ditch	East Hallong
50	AP23	23/0	DD+06	47°30'44"	R	331	14454	344	110.55	218	212	430	251	246	497	675	338	Brick Rd, 220V Line, Ditch, Nallah	Hallong
51	AP24	24/0	DB+06	10°30'11"	R	253	14785	331	100.67	119	136	255	85	142	227	586	293	Agricultural Land, Can Track, Nallah	Radhpur

For EMC Limited
Submitted by: *Sudhanu Hazra*
Checked by: *Dhirendra*
Recommended by: *Co-ordinate of locs. are to be incorporated. 375721*
Approved by: _____

Proposed 132kV. D/C Transmission Line from Kailashahar to Darmanagar

Tower Schedule															Crossing Details / Remarks	Village Name			
Sl No.	AP No.	Loc. No.	Type of Tower	Angle of Deviation	Span in Metre	Condu. Dist. (M)	Section Length	Reduce Level	Weight Span(H)			Weight Span(C)					Sum of Adjacent Span	Wind Span	
									Left	Right	Total	Left	Right	Total					
24		14/1	DB+00			6840	257	137	-113	142	29	-287	95	-192	670	335	UNOKOTI RESERVED FOREST, Agricultural Land, Nallah		
25		14/2	DB+09			413	7253	413	145	271	170	441	318	146	464	818	409	UNOKOTI RESERVED FOREST	
26	AP15	15/0	DB+09	11°17'36"	R	315	7658	405	153.5	235	165	400	259	170	429	720	360	UNOKOTI RESERVED FOREST, Nallah	Forest Area
27		15/1	DB+00			297	7973	315	161	150	201	351	145	240	385	612	306	Nallah, Brick Road (To be Diverted) 11 Kv Line (To be Diverted)	
28		15/2	DB+00			475	8270	297	151	96	356	452	57	441	498	772	386	Ditch, Brick Road, Agricultural Land	
29		15/3	DB+03			275	8745	475	112.31	119	143	262	34	147	181	730	375	Can Track, Pucca Road,	
30		15/4	DA+03			263	9020		111.31	132	153	287	128	172	300	538	269	220 KV Line, Agricultural Land	
31	AP16	16/0	DD+06	36°35'49"	L	297	9283	538	110.35	108	118	226	91	95	186	560	280	220V Line, Brick Road	Anandabazar
32		16/1	DB+06			274	9580	297	110.2	179	178	357	202	207	409	571	286	Agricultural Land	
33	AP17	17/0	DD+00	38°30'52"	L	224	9854	274	109.08	96	117	213	67	120	187	498	249	220V Line, Brick Road	Rajnagar
34		17/1	DA+00			233	10078		108.4	107	130	237	104	121	225	459	230	Agricultural Land	
35		17/2	DA+00			230	10313		108.1	115	115	230	114	114	228	465	233	Pucca Road, 220V Line	
36		17/3	DA+00			259	10543		108.16	115	129	244	116	129	245	489	245	Ditch, Agricultural Land	

For EMC Limited
Submitted by: *Sudhanu Hazra*
Checked by: *Dhirendra*
Recommended by: *Co-ordinate of locs. are to be incorporated. 375721*
Approved by: _____

Proposed 132kV. D/C Transmission Line from Kailashahar to Darmanagar

Tower Schedule																		
Sl No.	AP No.	Loc. No.	Type of Tower	Angle of Deviation	Span in Metre	Cumu. Dist. (M)	Section Length	Reduce Level	Weight Span(H)			Weight Span(C)			Sum of Adjacent Span	Wind Span	Crossing Details / Remarks	Village Name
									Left	Right	Total	Left	Right	Total				
12		7/1	DB+03		149	3212	464	148	295	138	433	340	183	523	613	307		
					214	3361	149	145	11	-146	-135	-34	-329	-363	363	182	UNOKOTI RESERVED FOREST, Rubber Plantation	Turbhuni
13	AP08	8/0	DB+00	12°32'50"	R												UNOKOTI RESERVED FOREST	
14		8/1	DB+00		482	3575	214	179.5	360	103	463	543	2	545	696	348	UNOKOTI RESERVED FOREST, Tea Garden	
15	AP09	9/0	DC+00	18°48'00"	R												Pucca Road, UNOKOTI RESERVED FOREST, NH-208A	Forest Area
					286	4343	286	226	165	206	371	181	175	356	782	391	UNOKOTI RESERVED FOREST	
16		9/1	DB+00		496	4839	496	239.3	290	-52	238	321	-209	112	827	414	UNOKOTI RESERVED FOREST, Pucca Road	
17		9/2	DB+00		331	5170	331	283.06	383	45	428	540	11	551	517	259	UNOKOTI RESERVED FOREST, Tea Garden	Forest Area
18	AP10	10/0	DC+00	20°08'35"	L												UNOKOTI RESERVED FOREST, Tea Garden	
					186	5356	186	281.73	141	394	535	175	571	746	487	244	Kancha Road, UNOKOTI RESERVED FOREST	
19		10/1	DB+00		301	5657	301	235	-91	424	331	-270	605	335	648	324	UNOKOTI RESERVED FOREST, Pucca Road (2 nos), Nalah (2 nos)	Forest Area
20	AP11	11/0	DC+00	15°58'33"	L												UNOKOTI RESERVED FOREST, Pucca Road (2 nos), Nalah	Forest Area
					347	6004	347	182.7	-77	287	210	-258	388	130	643	322	UNOKOTI RESERVED FOREST, Pucca Road (2 nos), Nalah	Forest Area
21	AP12	12/0	DC+00	20°23'55"	R												UNOKOTI RESERVED FOREST, Pucca Road, Nalah	Forest Area
					296	6300	296	159.5	9	64	73	-92	8	-84	579	290	UNOKOTI RESERVED FOREST, Pucca Road, Nalah	Forest Area
22	AP13	13/0	DD+03	39°43'33"	R												UNOKOTI RESERVED FOREST, Pucca Road, Nalah	Forest Area
					283	6583	283	170.5	219	370	589	273	544	819	540	270	UNOKOTI RESERVED FOREST	Forest Area
23	AP14	14/0	DB+00	09°41'02"	R												UNOKOTI RESERVED FOREST	
					257													

EMC Limited
Surveyed by

For EMC Limited
Submitted by: Dheerendra
Checked by
Recommended by
Approved by

For Power Grid orporation of India limited
Checked by
Recommended by
Approved by

Proposed 132kV. D/C Transmission Line from Kailashahar to Darmanagar

Tower Schedule																				
Sl No.	AP No.	Loc. No.	Type of Tower	Angle of Deviation	Span in Metre	Cumu. Dist. (M)	Section Length	Reduce Level	Weight Span(H)			Weight Span(C)			Sum of Adjacent Span	Wind Span	Crossing Details / Remarks	Village Name		
									Left	Right	Total	Left	Right	Total						
79	AP38	38/0	DD+00	47°01'28"	L		21667	180	97.26	81	-5	76	75	-54	21	307	154	Nallah, Residential Area, 220V, 11KV, & 440V Line, Pucca Rd, Ditch	Ganganagar	
80	AP39	39/0	DD+03	31°07'36"	L		127	21794	127	99.77	132	69	201	181	92	273	199	100	Ditch	Mission Tilla
81	AP40	40/0	DD+00	21°43'34"	L		72	21866	72	101.28	3	-98	-95	-20	-186	-206	122	61	11KV Line, Brick Road, Fence	Mission Tilla
0	GNT	GNT	GNT				50	21916	50	105.18	148	0	148	236	0	236	50	25		Mission Tilla S/S

EMC Limited
Surveyed by

For EMC Limited
Submitted by: Dheerendra
Checked by
Recommended by
Approved by

For Power Grid orporation of India limited
Checked by
Recommended by
Approved by



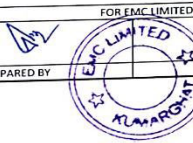
FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



LILO of 132kV Ambassa - PK Bari line at Manu S/S - 0.897 Km

NAME OF CLIENT : POWER GRID CORPORATION OF INDIA LIMITED																	
LILO LINE OF 132KV S/C AMBASA - P.K.BARI AT MANU																	
CHECK SURVEY REPORT AP- 1/0 To AP- GANTRY (0.345 KM)																	
SL NO	AP NO.	LOCATION NO	TYPE OF TOWER	ANGLE OF DEVIATION	SPAN IN METER	SECTION LENGTH	CUMULATIVE CHAINAGE	SL NO	AP NO.	LOCATION NO	TYPE OF TOWER	ANGLE OF DEVIATION	SPAN IN METER	SECTION LENGTH	CUMULATIVE CHAINAGE	BENCHING & REVETMENT	REMARKS
AS PER DETAIL SURVEY								AS PER CHECK SURVEY									
1	1	1/0	DD+3	90°00'00"	25	25	25	1	1	1/0	DD+3	90°00'00"	25	25	25	Required*	RUBBER PLANTATION
2	2	2/0	DD+6	39°02'00" LT	140	140	165	2	2	2/0	DD+6	39°02'00" LT	140	140	165	Required*	RUBBER PLANTATION
3	3	3/0	DD+0	32°39'45" LT	94	94	259	3	3	3/0	DD+0	32°39'45" LT	94	94	259	Required*	RUBBER PLANTATION
4	4	4/0	DDE+9	19°43'10" LT	86	86	345	4	4	4/0	DDE+9	19°43'10" LT	86	86	345	Required*	
5	GANTRY	GANTRY	0		86	86	345	5	GANTRY	GANTRY	0						

*Benching & Revetment will be proposed later



FOR EMC LIMITED
SUBMITTED BY
Duesendee

FOR PGCL
CHECKED BY
Srija Das

FOR PGCL
RECOMMENDED BY
Asstt. G.M. P. Kumargh

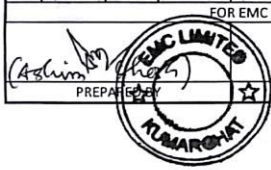
APPROVED BY

Dead by tower to side
of benching side (SP)
of deviation side as
angle deviation on both side
in graph

AP 1/0 & 2/0
are now approved,
the previous had been
recom release

AP 1/0, 2/0
are not on temporary L&T
rest others are
approved
11/11/18

NAME OF CLIENT : POWER GRID CORPORATION OF INDIA LIMITED																		
132KV D/C P.K.BARI - AMBASA TRANSMISSION LINE TAPPING ARRANGMENT FOR LILO AT MANU S/S																		
DETAILED SURVEY REPORT EXISTING LOC NO- 229 To EXISTING LOC-232 (0.830Km)																		
SI NO	LOCATION NO	TYPE OF TOWER	ANGLE OF DEVIATION	SPAN IN METER	SECTION LENGTH	CUMULATIVE CHAINAGE	RL	SUM OF ADJACENT SPAN	WIND SPAN	HOT WEIGHT SPAN			COLD WEIGHT SPAN			CO-ORDINATE		REMARKS
										LEFT	RIGHT	TOTAL	LEFT	RIGHT	TOTAL	E	N	
1	EXIST-229	DA+3					84.50				192	192		205.56	205.56	92° 00'17.46"	24° 00'55.61"	RUBBER PLANTATION
2	EXIST-230	DB+3	00°00'00"	344	344	328	80.60	380	190	152	274	426	138.44	315.91	454.35	92° 00'10.26"	24° 00'47.03"	RUBBER PLANTATION
3	AP-1/0	DD+3	90°00'00"	380	380	380	76.98	207	103.5	0	11	11	0	11	11	92°00'09.40"	24°00'45.65"	RUBBER PLANTATION
4	AP-1B/0	DB+0	00°00'00"	535	535	535	73.98	450	225	275	23	298	349	-17	332	92°00'06.11"	24°00'41.50"	NH OS, 11 KV & LT LINE
5	EXIST-232	DA+0		830	830	830	53.45		0	20	20	0	-54	-54		92°00'00.18"	24°00'34.00"	



FOR EMC LIMITED
SUBMITTED BY
Aachhadee

FOR PGCL
RECOMMENDED BY
Asstt. G.M. P. Kumargh
Field Engineer, NERPSIP
Powergrid/ Kumargh

FOR PGCL
APPROVED BY
Asstt. G.M. P. Kumargh



FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



132/33 kV Ambassa (Existing) - 33/11kV Jawahar Nagar (New) 33 kV line - 6.40 km

SHAR T&E.C.
S&P&C.I.L

LINK NAME :- ext.ambssa to jawaharnagar s/s

SL.NO	DETAIL SURVEY AP. NO	TYPE OF STRUCTURE	ANGLE OF DEVIATION	SPAN	SECTION LENGTH	CUMULV. LENGTH	CROSSING	GPS CO-ORDINATE(WGS-84)		REMARKS
								NORTHING	EASTING	
1	AP-21	DP+0	10°09'15"LT							
2	LOC-21/1	SP+0		45				23°55'34.27"	91°51'22.2"	
3	LOC-21/2	SP+0		43	175	45				
4	LOC-21/3	SP+0		45		88				
5	AP-22	DP+0	16°18'02"RT	42		133				
6	LOC-22/1	SP+0		38	175	175		23°55'36.01"	91°51'28.12"	
7	AP-23	DP+0	32°11'00"RT	38	76	213				
8	AP-24	DP+0	30°40'33"LT	42	42	251		23°55'36.03"	91°51'30.77"	
9	LOC-24/1	SP+0		38		293		23°55'35.32"	91°51'32.09"	
10	AP-25	DP+0	34°14'17"RT	38	76	331	Metal road			
11	AP-26	SP+0	06°46'06"RT	37	37	369		23°55'35.31"	91°51'34.78"	
12	AP-27	DP+0	60°00'00"LT	38	38	408	Metal road	23°55'34.67"	91°51'35.84"	
13	AP-28	SP+0	7°34'23"LT	42	42	444		23°55'33.86"	91°51'36.81"	
14	AP-29	DP+0	30°49'33"LT	50	50	486		23°55'34.36"	91°51'38.22"	
15	LOC-29/1	SP+0		45		536		23°55'35.12"	91°51'39.73"	
16	LOC-29/2	SP+0		45	135	581				
17	AP-30	DP+0	12°04'54"RT	45		626				
18	LOC-30/1	SP+0		45		671		23°55'36"	91°51'44.43"	
19	LOC-30/2	SP+0		45	135	716				
20	AP-31	SP+0	08°57'51"RT	45		761	brick road			
21	LOC-31/1	SP+0		37		809		23°55'35.93"	91°51'49.2"	
22	AP-32	DP+0	31°39'02"LT	37	74	843				
23	AP-33	DP+0	27°59'31"LT	49	49	880	brick road	23°55'35.5"	91°51'51.75"	
24	LOC-33/1	SP+0		45		929		23°55'36.1"	91°51'53.41"	
25	LOC-33/2	SP+0		45		974				
						1019				

FORWARDED BY:
KUMAR

PROJECT MANAGER
SUPREME & CO. PVT. LTD

PAGE-1/6

373/21

अरविंद दास/ARABINDA DAS
महा प्रबंधक/GENERAL MANAGER
पावरग्रिड/POWERGRID
NERPSIP, KUMARGHAT.

APPROVED BY:-

SHAR T&E.C.
S&P&C.I.L

LINK NAME :- ext.ambssa to jawaharnagar s/s

SL.NO	DETAIL SURVEY AP. NO	TYPE OF STRUCTURE	ANGLE OF DEVIATION	SPAN	SECTION LENGTH	CUMULV. LENGTH	CROSSING	GPS CO-ORDINATE(WGS-84)		REMARKS
								NORTHING	EASTING	
26	LOC-33/3	SP+0		45	230					
27	LOC-33/4	SP+0		45		1064				
28	AP-34	DP+0	44°46'48"LT	50		1109				
29	LOC-34/1	SP+0		45		1159		23°55'41.79"	91°51'58.63"	
30	LOC-34/2	SP+0		45	158	1204				
31	LOC-34/3	SP+0		40		1249				
32	AP-35	DP+0	45°25'26"RT	28		1289	metal road, LT line			
33	AP-36	SP+0	06°29'55"LT	33	33	1317		23°55'46.89"	91°51'58.2"	
34	LOC-36/1	SP+0		39	78	1350		23°55'47.71"	91°51'58.97"	
35	AP-37	SP+0	16°23'49"LT	39		1389				
36	LOC-37/1	SP+0		45		1428		23°55'49.84"	91°52'0.369"	
37	LOC-37/2	SP+0		45	128	1473				
38	AP-38	DP+0	40°51'29"RT	38		1518				
39	AP-39	DP+0	40°58'44"RT	32	32	1556	metal road, LT line	23°55'53.84"	91°52'1.572"	
40	LOC-39/1	SP+0		36		1588		23°55'54.47"	91°52'2.521"	
41	AP-40	SP+0	29°36'16"LT	36	72	1624				
42	AP-41	DP+0	22°05'23"LT	31		1660		23°55'54.19"	91°52'5.071"	
43	LOC-41/1	SP+0		47		1691		23°55'54.59"	91°52'6.057"	
44	AP-42	DP+0	52°53'42"RT	47	94	1738				
45	AP-43	DP+0	21°44'35"RT	41	41	1785		23°55'56.72"	91°52'8.444"	
46	AP-44	DP+0	53°31'00"LT	44	44	1826	metal road	23°55'56.54"	91°52'9.896"	
47	LOC-44/1	SP+0		45		1870		23°55'55.83"	91°52'11.24"	
48	AP-45	DP+0	26°16'43"RT	36		1915				
49	LOC-45/1	SP+0		36	72	1960	metal road	23°55'57.02"	91°52'14.17"	
						1996				

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अरविंद दास/ARABINDA DAS
महा प्रबंधक/GENERAL MANAGER
पावरग्रिड/POWERGRID
NERPSIP, KUMARGHAT.

APPROVED BY:-

OWNER: T.S.E.C.L.
 CLIENT: P.G.C.I.L.

DETAIL POLE SCHEDULE


LINK NAME :- ext.ambosa to jawaharnagar 1/1

SL.NO	DETAIL SURVEY AP. NO	TYPE OF STRUCTURE	ANGLE OF DEVIATION	SPAN	SECTION LENGTH	CUMULV. LENGTH	CROSSING	GPS CO-ORDINATE(WGS-84)		REMARKS
								NORTHING	EASTING	
50	AP-46	SP+0	13°10'40"LT		48	2032		23°55'56.88"	91°52'16.68"	
51	AP-47	DP+0	17°02'10"RT	48	48	2080	metal road	23°55'57.09"	91°52'18.34"	
52	LOC-47/1	SP+0		30	66	2110				
53	AP-48	DP+0	11°43'28"RT	38	38	2148	metal road	23°55'56.71"	91°52'20.71"	
54	AP-49	SP+0	35°10'45"RT	39	39	2180		23°55'56.27"	91°52'21.96"	
55	AP-49/1	SP+0		39	78	2225				
56	AP-50	DP+0	17°22'50"LT		53	2264		23°55'54.13"	91°52'23.49"	
57	AP-51	DP+0	51°01'40"LT		53	2317	metal road	23°55'53.01"	91°52'24.92"	
58	LOC-51/1	SP+0		45	136	2362				
59	LOC-51/2	SP+0		45	136	2407				
60	AP-52	DP+0	26°05'57"RT		46	2453	metal road	23°55'53.89"	91°52'29.65"	
61	LOC-52/1	SP+0		45	124	2498	metal road			
62	LOC-52/2	SP+0		45	124	2543				
63	AP-53	SP+0	05°39'07"LT		34	2577		23°55'52.85"	91°52'33.91"	
64	AP-54	SP+0	10°43'53"LT	42	42	2619	metal road	23°55'52.66"	91°52'35.39"	
65	AP-55	SP+0	04°46'40"LT	49	49	2668	metal road, LT line	23°55'52.67"	91°52'37.13"	
66	AP-56	DP+0	26°19'44"LT	48	48	2716		23°55'52.88"	91°52'38.82"	
67	AP-57	DP+0	37°50'05"LT	45	45	2761	metal road, LT line	23°55'53.64"	91°52'40.16"	
	AP-58	DP+0	42°25'46"RT		51	2806				
	AP-59	DP+0	43°41'50"RT		39	2857				
	LOC-59/1	DP+0		56	2806					
75	AP-60	DP+2.5	58°20'57"LT		32.00	2952		23°55'55.11"	91°52'45.42"	
76	LOC-60/1	SP+0		32.00	64	2984				
77	AP-61	DP+0	50°32'26"LT		32.00	3016		23°55'53.1"	91°52'46.14"	
78	LOC-61/1	SP+0		45		3061				

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अरविंद दारा/ARABINDA DAS
महा प्रबंधक/GENERAL MANAGER
पावरग्रिड/POWERGRID
NERPSIP, KUMARGHAT.

APPROVED BY:-

 OWNER: T.S.E.C.L.
 CLIENT: P.G.C.I.L.

DETAIL POLE SCHEDULE

LINK NAME :- ext.ambosa to jawaharnagar 1/1

SL.NO	DETAIL SURVEY AP. NO	TYPE OF STRUCTURE	ANGLE OF DEVIATION	SPAN	SECTION LENGTH	CUMULV. LENGTH	CROSSING	GPS CO-ORDINATE(WGS-84)		REMARKS
								NORTHING	EASTING	
79	LOC-61/2	SP+0		45	134	3106				
80	AP-62	DP+2.5	43°34'08"RT	44		3150	Metal road, 11kv	23°55'51.47"	91°52'50.54"	
81	LOC-62/1	SP+2.5		29	58	3179	11kv			
82	AP-63	DP+0	50°08'26"LT	29	29	3208		23°55'49.75"	91°52'51.37"	
83	AP-64	SP+0	14°17'41"LT	37	37	3245		23°55'49.44"	91°52'52.65"	
84	AP-65	DP+2.5	49°37'06"LT	40	40	3285		23°55'49.41"	91°52'53.92"	
85	LOC-65/1	SP+0		43		3328	Metal road, 11kv	23°55'45.45"	91°52'58.02"	
86	LOC-65/2	SP+0		45	169	3373				
87	LOC-65/3	SP+0		45	169	3418				
88	AP-66	DP+0	23°50'09"RT	36		3454		23°55'42.73"	91°53'0.207"	
89	LOC-66/1	SP+0		40	80	3494				
90	AP-67	DP+2.5	56°39'24"LT	40		3534		23°55'43.89"	91°53'3.132"	
91	AP-68	DP+2.5	36°50'43"LT	36	36	3570	Metal road, 11kv	23°55'43.82"	91°53'6.423"	
92	LOC-68/1	SP+0		45	90	3615	Metal road, LT	23°55'43.01"	91°52'59"	
93	AP-69	DP+0	24°35'20"RT	45		3660		23°55'42.49"	91°53'7.46"	
94	LOC-69/1	SP+0		46	92	3706				
95	AP-70	DP+0	52°17'17"RT	46		3752		23°55'40.9"	91°53'7.403"	
96	AP-71	DP+0	38°36'11"RT	50	50	3802	metal road, LT line			
97	AP-72	DP+0	52°43'53"LT	50	50	3852		23°55'38.87"	91°53'10.03"	

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पावरग्रिड/POWERGRID
NERPSIP, KUMARGHAT.

APPROVED BY:-

OWNER: T.S.E.C.L.
CLIENT: P.G.C.I.L.

DETAIL POLE SCHEDULE

LINK NAME - ext.ambisa to jawaharnagar s/s

SL.NO	DETAIL SURVEY AP. NO	TYPE OF STRUCTURE	ANGLE OF DEVIATION	SPAN	SECTION LENGTH	CUMLV. LENGTH	CROSSING	GPS CO-ORDINATE(WGS-84)		REMARKS
								NORTHING	EASTING	
98	LOC-72/1	SP+0		48	96	3900		23°55'36.4"	91°53'9.846"	
99	AP-73	DP+0	53°45'18"RT	48	77	3948				
101	AP-74	SP+0	08°20'59"RT	77		4025				
102	LOC-74/1	SP+0		43	134	4068				
103	LOC-74/2	SP+0		45		4113				
104	AP-75	DP+0	32°42'09"LT	46		4159		23°55'29.63"	91°53'9.975"	
106	AP-76	DP+0	14°40'25"RT	82		4241		23°55'24.95"	91°53'13.58"	
107	LOC-76/1	SP+0		45		4286				
108	LOC-76/2	SP+0		45	176	4331				
109	LOC-76/3	SP+0		43		4374				
110	AP-77	DP+0	30°32'51"RT	43		4417		23°55'19.1"	91°53'14.2"	
111	LOC-77/1	SP+0		45	180	4462				
112	LOC-77/2	SP+0		45		4507				
113	LOC-77/3	SP+0		45		4552				
114	AP-78	DP+0	21°21'04"RT	45		4597		23°55'16.07"	91°53'13.23"	
115	LOC-78/1	SP+0		49	98	4646				
116	AP-79	DP+0	58°33'01"LT	49		4695		23°55'14.65"	91°53'14.63"	
117	AP-80	DP+0	59°54'32"LT	58	58	4753		23°55'15.22"	91°53'17.42"	
118	LOC-80/1	SP+0		37	81	4790				
119	AP-81	DP+0	23°45'05"RT	44		4834		23°55'14.84"	91°53'19.47"	
120	AP-82	DP+0	35°50'48"RT	43	43	4877				
121	LOC-82/1	SP+0		46	93	4923				

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GENERAL MANAGER
पावरग्रिड/POWERGRID
NERPSIP, KUMARGHAT.

APPROVED BY:-

OWNER: T.S.E.C.L.
CLIENT: P.G.C.I.L.

DETAIL POLE SCHEDULE

LINK NAME - ext.ambisa to jawaharnagar s/s

SL.NO	DETAIL SURVEY AP. NO	TYPE OF STRUCTURE	ANGLE OF DEVIATION	SPAN	SECTION LENGTH	CUMLV. LENGTH	CROSSING	GPS CO-ORDINATE(WGS-84)		REMARKS
								NORTHING	EASTING	
122	AP-83	DP+0	26°28'45"LT	47		4970	brick road	23°55'12.98"	91°53'21.96"	
123	LOC-83/1	SP+2.5		47	103	5017				
124	AP-84	DP+0	59°11'23"RT	56		5073	River	23°55'10.88"	91°53'24.84"	
125	AP-85	DP+2.5		30		5103				
126	LOC-85/1	SP+2.5		35	100	5138	NH-44	23°55'9.945"	91°53'24.71"	
127	AP-86	FP+0	86°40'14"RT	35		5173		23°55'7.73"	91°53'24.13"	
128	BAY	GANTRY		13	13	5186		23°55'7.792"	91°53'23.67"	

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GENERAL MANAGER
पावरग्रिड/POWERGRID
NERPSIP, KUMARGHAT.

APPROVE

132/33 kV Manu (New) - 33/11 kV Dhumachhera (New) 33kV line - 3.55 Km

POLE SUMMARY DETAILS								
Tripura State Associated with NER Power System Improvement Project (DMS PACKAGE 05)								
TRI-DMS-05(3605)CC-CS/86-NER/REW-2988/1/G2/NOA - I & II / 7170 & 7171 Dated- 22/03/2017								
LINK NAME :-MANU EXISTING 132/33KV S/S TO PROPOSED 33/11 KV DHUMACHHERA S/S								
OLD LINE LENGTH-3.67 KM				NEW LINE LENGTH-2.958 KM				
SL NO	TYPYR OF POLE	EXT	POLE QT.	12 (M)	14.5 (M)	POLE QT.	12 (M)	14.5 (M)
1	SP (GA-01)	0	34	34		18	18	
2		2.5	8		8	6		6
3	SP (GA-02)	0	3	3		9	9	
4		2.5	3		3	1		1
5	DP (GA-03)	0	18	36		23	46	
6		2.5	9		18	7		14
7	FP (GA-04)	0	7	28		4	16	
8		2.5	2		8			0
TOTAL				101	37	89	21	



(Signature)
04/11/2019

(Signature)
(P.G.C.I.)

Managers (Elect.)
Manu Electrical Sub-Division
LTV, Dhalai Tripura

SL. NO	AP NO	POLE NO.	TYPE OF POLE	EXT. of mtr.	ANGL E OF DEVIATION	SPAN	SECTIONAL LENGTH	CUMULV. LENGTH	CROSSING	VILLAGE NAME	G.S CO-ORDINAT E (WGS-84) NORTHING	EASTING	REMARKS
1	BAY	0	GANTRY			40	40			MANU			
2	AP-1	1	FP		DI	45		40		MANU	24°0'39.78"	91°59'57.48"	
3	LOC-1/1	2	SP			45	135		SS boundary	MANU			
4	LOC-1/2	3	SP+2.5	2.5		45			L1KV	MANU			
5	AP-2	4	DP+2.5	2.5	51°36'5.8"RT	45		175		MANU	24°0'36.16"	91°59'54.71"	
6	LOC-2/1	5	SP			45				MANU			
7	LOC-2/2	6	SP			45	175			MANU			
8	LOC-2/3	7	SP			40				MANU			
9	AP-3	8	DP+2.5	2.5	34°33'9"RT	30		350	L1KV	MANU	24°0'35.82"	91°59'48.52"	
10	LOC-3/1	9	SP+2.5	2.5		32	62			MANU			
11	AP-4	10	DP		39°48'5"LT	37		412	Village road,LT	MANU	24°0'36.85"	91°59'46.67"	
12	LOC-4/1	11	SP+2.5	2.5		45	127		L1KV	MANU			
13	LOC-4/2	12	SP+2.5	2.5		45				MANU			
14	AP-5	13	DP+2.5	2.5	34°45'4"RT	45		539	Metal Road,11KV	MANU	24°0'36.24"	91°59'42.25"	
15	LOC-5/1	14	SP+2.5	2.5		40	85			MANU			
16	AP-6	15	DP+2.5	2.5	25°6'6"RT	45		624	L1KV	MANU	24°0'37.46"	91°59'39.55"	
17	AP-7	16	DP+2.5	2.5	18°22'3"LT	45		669	L1KV	MANU	24°0'38.85"	91°59'38.34"	
18	LOC-7/1	17	SP			45	90			MANU			



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04/11/2019
Managers (Elect.)
Manu Electrical Sub-Division
LTV, Dhalai Tripura

(Signature)
(P.G.C.I.)

54	AP-30	DP	12°28'1"LT	46	45	2255			24°1'14"	91°59'9"
55	AP-31	FP	6°48'13"RT	127	46	2300			24°1'15"	91°59'8"
56	AP-32	FP	2°57'43"RT	46	127	2427	Manu River		24°1'18"	91°59'5"
57	AP-33	SP	0°43'23"RT	36	46	2473			24°1'19"	91°59'4"
58	AP-34	SP	1°23'51"RT	51	36	2509			24°1'20"	91°59'3"
59	AP-35	DP	11°37'3"RT	38	51	2560			24°1'21"	91°59'2"
60	AP-36	DP	24°54'7"RT	38	38	2598			24°1'21"	91°59'0"
61	AP-37	DP	33°8' "LT	44	38	2636			24°1'21"	91°58'59"
62	AP-38	DP	27°12'57"RT	39	44	2680	DH/MACHHERA		24°1'22"	91°58'58"
63	AP-39	DP	11°37'51"RT	48	39	2719	DH/MACHHERA		24°1'22"	91°58'57"
64	AP-40	SP	6°54'15"LT	30	48	2767	DH/MACHHERA		24°1'22"	91°58'55"
65	LOC-40/1	SP		30	60					
66	AP-41	SP	5°42'33"RT	47		2827	DH/MACHHERA		24°1'23"	91°58'53"
67	AP-42	DP	20°24'56"RT	46	47	2874	DH/MACHHERA		24°1'23"	91°58'51"
68	AP-43	SP	1°58'30"LT	38	46	2920	DH/MACHHERA		24°1'22"	91°58'50"
69	AP-44	FP			38	2958	DH/MACHHERA		24°1'22"	91°58'48"



[Signature]
Managers (Elect.)
Manu Electrical Sub-Division
LTV, Dhalai Tripura

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(PACLL)

132/33 kV Manu (New) - 33/11kV 82 Mile (new) 33 kV line - 11.245 Km

OWNER: S.E.C.L. CLP/1/PSC/1
 DETAIL SURVEY POLE EXCEED SECUDE
 LINK NAME: MANU 132/33 kv 5/5 TO *82 mile*

SL. NO.	AP NO.	POLE NO.	TYPE OF POLE	EXT. of mtr.	ANGLE OF DEVIATION	SPAN	SECTIONAL LENGTH	CROSSING	VILLAGE NAME	GPS CO-ORDINATE(WGS-84)		REMARKS
										NORTHING	EASTING	
1	Bay	0	GANTRY						Manu 132/33 kv 5/5			BAY GANTRY
5	LOC-2/1	4	SP+0			36	36		Manu			BIG TREE
6	LOC-2/2	5	SP+0			35	103		Manu			BIG TREE
7	AP-3	6	FP+0			33			Manu			BIG TREE
13	AP-6	12	DP+2.5	2.5	89°48'11"RT 13°4'12"LT	39	39	132 kv s/c	Manu	24°044.04"	91°59'56.88"	132 KV CROSSING
14	AP-7	13	DP+0		29°14'58"RT	35			Manu	24°041.14"	92°06.567"	LOW LAND
15	LOC-7/1	14	SP+0			30	96	Nala	Manu			NALA CROSSING
16	LOC-7/2	15	SP+0			31			Manu			BIG TREE
17	AP-8	16	DP+0		32°31'45"LT	40			Manu	24°040.16"	92°09.796"	LOW LAND
20	AP-9	19	DP+0		32°31'45"LT	41			Manu	24°041.19"	92°014.28"	
24	AP-10	23	SP+0		3°26'2"RT	41			Manu	24°046.83"	92°015.69"	BIG TREE
25	LOC-10/1	24	SP+0			41			Manu			BIG TREE
26	LOC-10/2	25	SP+0			41	163		Manu			BIG TREE
27	LOC-10/3	26	SP+0			40			Manu			BIG TREE
28	AP-11	27	DP+0		18°5'56"LT	39		132 kv s/c	Manu	24°051.91"	92°017.31"	132 KV CROSSING
31	AP-12	30	DP+2.5	2.5	11°10'24"RT	37		11kv	Masli	24°056.1"	92°017.17"	11 KV CROSSING
38	LOC-14/1	37	SP+2.5	2.5		33			Masli			ROAD CROSSING
39	AP-15	38	SP+2.5	2.5	9°15'34"LT	33			Masli	24°15.894"	92°021.98"	ROAD CROSSING
40	LOC-15/1	39	SP+0			31	94		Masli			ROAD CROSSING
41	LOC-15/2	40	SP+0			30			Masli			ROAD CROSSING
42	AP-16	41	DP+2.5	2.5	39°3'42"LT	35		MRD,11KV	Masli	24°18.216"	92°024.12"	11 KV AND ROAD CROSSING
43	LOC-16/1	42	SP+2.5	2.5		35	106		Masli			11 KV AND ROAD CROSSING
44	LOC-16/2	43	SP+0			36			Masli			11 KV AND ROAD CROSSING
45	AP-17	44	SP+0		9°47'22"RT	57	57		Masli	24°11.69"	92°024.2"	RABBER GARDEN
49	AP-19	48	DP+0		11°19'48"RT	40			Masli	24°117.2"	92°026.53"	BIG TREE
52	LOC-19/3	51	SP+0			35		POND	Masli			POND CROSSING
53	LOC-19/4	52	SP+0			31			Masli			POND CROSSING
54	AP-20	53	DP+0		27°56'19"RT	38			Masli	24°120.72"	92°032.34"	
60	AP-23	59	DP+0		14°48'33"LT	38			Masli	24°126.82"	92°035.87"	NALA
61	LOC-23/1	60	SP+0			40	244		Masli			NALA
62	LOC-23/2	61	SP+0			32			Masli			NALA
63	LOC-23/3	62	SP+0			32			Masli			NALA
66	AP-24	65	DP+0		44°28'17"RT	38			Masli	24°134.38"	92°034.01"	HUT
67	LOC-24/1	66	SP+0			32	102		Masli			PUMP HOUSE
68	LOC-24/2	67	SP+0			32			Masli			PUMP HOUSE
71	AP-25	68	DP+0		12°52'30"RT	41	41	BRICK ROAD	Masli	24°137.19"	92°035.9"	ROAD CROSSING AND BIG TREE
72	AP-29	76	SP+0		5°10'47"LT	28	28		Masli	24°141.88"	92°046.48"	ROAD CROSSING
78	AP-30	77	DP+0		48°58'58"RT	28	28	RAIL WAY LINE (SILCHER TO AGARTALA)	Masli	24°141.53"	92°047.5"	RAIL WAY CROSSING
79	AP-31	78	FP+0		73°37'54"LT	30	50		Masli	24°140.72"	92°048.33"	RAIL WAY CROSSING
80	AP-32	79	FP+0		94°37'7"LT	32			Masli	24°140.99"	92°050.07"	HUT
81	LOC-32/1	80	SP+0			30	95	BRICK ROAD	Masli			ROAD CROSSING
82	LOC-32/2	81	SP+0			33			Masli			ROAD
83	AP-33	82	DP+0		25°7'1"RT	39		FOOT PATH	Masli	24°144.01"	92°049.23"	ROAD CROSSING AND FOOT PATH
84	LOC-33/1	83	SP+0			50		POND	Masli	24°148.27"	92°050.12"	POND CROSSING
85	LOC-33/2	84	SP+0			34	68		Masli			POND
86	AP-34	85	DP+0		52°57'12"RT	34			Masli	24°149.26"	92°052.3"	POND
87	LOC-34/1	86	SP+0			37	74		Masli			POND
88	AP-35	87	DP+0		46°43'55"LT	37			Masli			HUT
89	LOC-35/1	88	SP+0			37			Masli			
90	AP-36	89	DP+2.5	2.5	24°25'27"RT	37			Masli	24°151.54"	92°053.06"	

Submitted by

TECHNOFAB ENGINEERING LIMITED
 TRIPURA


 (PACIL)

Conditional
 27/5/25

DETAIL SURVEY POLE EXCEED SECUDLE

LINK NAME:-
MANU 132/33 KV 5/5 TO : 8.2 mile

Sl. No.	Loc/Line	Span	Dist	Angle	Station	Altitude	Remarks	Remarks
91	LOC-36/1	90	SP+0				VILL. ROAD	ROAD CROSSING
92	AP-37	91	DP+0		23°38'4"LT		Mesti	BIG TREE
100	LOC-38/4	99	SP+0				Mesti	11 KV AND ROAD CROSSING
101	AP-39	100	DP+0		32°7'9"RT		Mesti	ROAD CROSSING
102	LOC-39/1	101	SP+0				Mesti	BROF
105	AP-41	104	DP+2.5	2.5	40°59'48"LT		Mesti	NH-44 AND 11KV CROSSING
106	AP-42	105	DP+2.5	2.5	27°38'4"RT		Mesti	
109	AP-43	108	DP+0		51°40'28"LT		Mesti	BRIT AND VILLAGE ROAD
110	AP-44	100	FP+2.5	2.5	67°37'12"RT		Mesti	11 KV AND BRIT
111	AP-45	110	DP+2.5	2.5	35°7'37"LT		Mesti	
114	LOC-45/9	113	SP+0				Mesti	RABBER GARDEN
115	LOC-45/4	114	SP+0				Mesti	RABBER GARDEN AND VALLEY
116	AP-46	115	DP+0		34°36'23"LT		Mesti	VALLEY AND BRIT
117	LOC-46/1	116	SP+0				Mesti	VALLEY
118	AP-47	117	DP+2.5	2.5	53°46'21"RT		Karamchhara	NH-44, 11KV LT CROSSING
119	LOC-47/1	118	SP+2.5	2.5			Karamchhara	VALLEY
122	LOC-49/1	121	SP+2.5	2.5			Karamchhara	11KV
123	LOC-49/2	122	SP+0				Karamchhara	BIG TREE
124	AP-50	123	DP+0	2.5	55°12'14"LT		Karamchhara	LOW LAND
129	LOC-52/2	128	SP+0				Karamchhara	ROAD
130	LOC-52/3	129	SP+0				Karamchhara	ROAD
132	LOC-53/1	131	SP+2.5	2.5			Karamchhara	FOOT PATH
133	LOC-53/2	132	SP+0				Karamchhara	FOOT PATH
134	LOC-53/3	133	SP+0				Karamchhara	BIG TREE
135	LOC-53/4	134	SP+0				Karamchhara	HOTEL
136	AP-54	135	FP+2.5	2.5	65°14'31"RT		Karamchhara	HOTEL
137	AP-55	136	DP+2.5	2.5	31°17'35"LT		Karamchhara	FOOT PATH, LT
147	LOC-55/10	146	SP+2.5	2.5			Karamchhara	11KV
148	LOC-55/12	147	SP+2.5	2.5			Karamchhara	11KV CROSSING
149	AP-56	148	DP+0		44°244"RT		Karamchhara	BRIT AND VILLAGE ROAD
150	LOC-56/1	149	SP+0				Karamchhara	FOOT PATH AND BRIT
151	LOC-56/2	150	SP+0				Karamchhara	NALA CROSSING
152	LOC-56/3	151	SP+0				Karamchhara	NALA
153	AP-57	152	SP+2.5	2.5	9°0'20"RT		Karamchhara	NALA
154	LOC-57/1	153	SP+0				Karamchhara	METAL ROAD, LT, POND
155	AP-58	154	SP+0		3°54'2"LT		Karamchhara	METAL ROAD, LT, POND CROSSING
156	LOC-58/1	155	SP+0				Karamchhara	HOTEL AND SCHOOL
157	AP-59	156	DP+0		22°39'52"LT		Karamchhara	HOTEL AND SCHOOL
163	AP-62	162	DP+0		34°49'52"RT		Karamchhara	HOTEL AND SCHOOL
164	LOC-62/1	163	SP+2.5	2.5			Karamchhara	LT CROSSING AND ROAD
165	LOC-62/2	164	SP+0				Karamchhara	BRIT
166	AP-63	165	DP+0		49°47'7"LT		Karamchhara	BRIT, ROAD AND LT
169	AP-65	168	DP+0		30°42'4"LT		Karamchhara	BRIT, ROAD AND LT
170	LOC-65/1	169	SP+2.5	2.5			Karamchhara	POND CROSSING
171	AP-66	170	FP+2.5	2.5	82°41'30"RT		Karamchhara	NH-44 NALA, 11KV
172	LOC-66/1	171	SP+0				Karamchhara	NH-44 NALA, 11KV CROSSING
173	AP-67	172	DP+0		14°5'34"RT		Karamchhara	POND CROSSING
174	LOC-67/1	173	SP+0				Karamchhara	POND CROSSING
179	AP-69	178	DP+0		25°23'50"RT		Karamchhara	POND CROSSING
180	LOC-69/1	179	SP+0				Karamchhara	POND CROSSING

G. K. SINGH
ENGINEERING
TRIPURA

(Handwritten Signature)

Conditional
23/3/24

DETAIL SURVEY POLE EXCEED SECUDLE

MANU 132/33 KV S/5 TO LINK NAME: 82 mile

181	LOC-69/2	180	SP+0		40
182	LOC-69/3	181	SP+0		40
183	AP-70	182	SP+0	7°0'34"RT	40
186	LOC-70/3	185	SP+0		39
187	AP-71	186	DP+0	11°48'45"LT	41
188	LOC-71/1	187	SP+0		41
189	LOC-71/2	188	SP+0		40
190	AP-72	189	DP+2.5	2.5 29°4'16"RT	40
191	LOC-72/1	190	SP+2.5	2.5	32
192	AP-73	191	DP+0	54°20'28"RT	32
196	AP-74	195	SP+0	9°34'27"LT	39
197	LOC-74/1	196	SP+0		38
198	AP-75	197	SP+0	5°23'22"LT	36
199	LOC-75/1	198	SP+0		40
200	LOC-75/2	199	SP+0		32
202	LOC-76/1	201	SP+0		40
203	LOC-76/2	202	SP+0		32
204	LOC-76/3	203	SP+0		30
205	AP-77	204	DP+0	31°25'47"RT	35
207	LOC-77/1	205	SP+0		37
208	AP-78	208	SP+0	7°41'58"RT	27
212	LOC-78/4	212	SP+0		38
213	AP-79	213	DP+0	11°54'31"RT	34
219	LOC-79/6	219	SP+2.5	2.5	40
220	AP-80	220	DP+2.5	2.5 27°1'14"RT	40
225	LOC-80/5	225	SP+0		40
226	AP-81	226	DP+0	52°48'44"LT	90
227	AP-82	227	FP+0	99°42'11"RT	37
229	LOC-82/2	229	SP+0		40
230	AP-83	230	SP+0	1°15'19"LT	40
231	LOC-83/1	231	SP+0		40
232	LOC-83/2	232	SP+0		36
233	LOC-83/3	233	SP+0		32
234	AP-84	234	SP+0	8°17'26"RT	36
237	AP-85	237	DP+0	40°6'4"RT	40
238	LOC-85/1	238	SP+0		40
239	LOC-85/2	239	SP+0		31
240	AP-86	240	DP+0	23°56'22"RT	41
241	LOC-86/1	241	SP+0		39
242	LOC-86/2	242	SP+0		40
243	AP-87	243	FP+0	89°1'9"LT	41
247	LOC-87/4	247	SP+0		41
248	AP-88	248	DP+0	17°2'56"RT	40
249	LOC-88/1	249	SP+0		41
250	LOC-88/2	250	SP+0		41

121		Karamchhara			BIG TREE
		Karamchhara			BIG TREE
		Karamchhara	24°3'31.91"	92°0'37.22"	BIG TREE
		Karamchhara			BIG TREE
		Karamchhara	24°3'37.33"	92°0'36.08"	BIG TREE
		Karamchhara			BIG TREE
		Karamchhara	24°3'40.96"	92°0'34.42"	BIG TREE
64	11KV, VILL.ROAD				11 KV, VILLAGE ROAD CROSSING
		Karamchhara			ROAD CROSSING
		Karamchhara	24°3'42.22"	92°0'32.64"	BIG TREE
		Karamchhara	24°3'48.23"	92°0'32.95"	BIG TREE
77	FOOT TRACK	Karamchhara			FOOT TRACK CROSSING
		Karamchhara	24°3'50.5"	92°0'32.43"	
	FOOT TRACK				POND AND FOOT TRACK CROSSING
	POND	Nalkata			POND CROSSING
	POND	Nalkata			POND CROSSING
		Nalkata			BIG TREE
		Nalkata	24°3'57"	92°0'26.83"	POND
		Nalkata			POND AND ROAD CROSSING
144		Nalkata			POND CROSSING
		Nalkata	24°3'57.16"	92°0'21.66"	POND CROSSING
		Nalkata			POND CROSSING
		Nalkata	24°3'58.35"	92°0'14.1"	POND CROSSING
	POND, BRICK ROAD	Nalkata			POND CROSSING
		Nalkata	24°4'1.965"	92°0'4.165"	LOW LAND
		Nalkata	24°4'8.394"	91°59'57.99"	RAIL WAY LINE, 11KV CROSSING
		Nalkata	24°4'8.178"	91°59'54.8"	Pineapple Garden
		Nalkata	24°4'12.27"	91°59'55.23"	VILLAGE ROAD
		Nalkata			Pineapple Garden
		Nalkata			VILLAGE ROAD
		Nalkata			Pineapple Garden
		Nalkata	24°4'17.09"	91°59'55.62"	VILLAGE ROAD
		Nalkata	24°4'21.06"	91°59'56.58"	VILLAGE ROAD
		Nalkata			BIG TREE
		Nalkata			BIG TREE
111		Nalkata			BIG TREE
		Nalkata			BIG TREE
		Nalkata	24°4'23.26"	91°59'59.71"	BIG TREE
	VILL.ROAD				VILLAGE ROAD CROSSING
120	132KV S/C	Nalkata			132 KV CROSSING
		Nalkata			132 KV CROSSING
		Nalkata	24°4'24.1"	92°0'3.533"	132 KV CROSSING
		Nalkata			Pineapple Garden
		Nalkata	24°4'30.98"	92°0'1.32"	BIG TREE
		Nalkata			Pineapple Garden
115					BIG TREE

G. Kumar


(Signature)
 (PACU)

Conditional
 2/3/24

132/33 kV P K Bari (Existing) -33/11 kV 82 Mile (New) 33 kV line - 8.107 Km

T.S.E.C.L. PGCIL	AP NO	POLE NO.	TYPE OF POLE	EXT. of mtr.	ANGLE OF DEVIATION	SPAN	SECTIONAL LENGTH	CUMLV. LENGTH	CROSSING	VILLAGE NAME	GPS CO-ORDINATE(WGS-84)		REMARKS
											NORTHING	EASTING	
	AP-1	1	DP+0		00°00'00"				SS BOUNDREY, MRD	pkhari	24°8'9.979"	92°0'35.54"	CABLE PART
	AP-2	2	DP+0		00°00'00"		80	80		pkhari	24°8'9.53"	92°0'36.46"	
	AP-3	3	SP+0		06°52'11"LT		30	110					
	LOC-3/1	4	SP+0				38				24°8'8.189"	92°0'40.26"	
	LOC-3/2	5	SP+0				38	115					
	AP-4	6	SP+2.5	2.5	06°27'58"RT		39	225	11KV		24°8'7.901"	92°0'40.87"	
	AP-5	7	DP+2.5	2.5	53°18'18"LT		22	247	NH-44, 11KV		24°8'8.527"	92°0'42.28"	
	AP-6	8	FP+2.5	2.5	78°32'16"RT		44	291					
	LOC-6/1	9	SP+0				40	80	VILL.ROAD		24°8'5.425"	92°0'43.96"	
	AP-7	10	DP+0		37°5'19"RT		40	371			24°8'4.897"	92°0'43.54"	
	AP-8	11	SP+0		5°37'26"RT		45	416			24°8'4.083"	92°0'43.84"	
	AP-9	12	SP+0		1°28'3"RT		27	443					
	LOC-9/1	13	SP+0				45	90					
	AP-10	14	DP+0		14°55'15"RT		45	533	BRICK ROAD	pkhari	24°8'1.187"	92°0'43.4"	
	LOC-10/1	15	SP+0				45						
	LOC-10/2	16	SP+0				45						
	LOC-10/3	17	SP+0				45	225					
	LOC-10/4	18	SP+0				45						
	AP-11	19	SP+0		2°32'17"RT		45	758			24°7'54.27"	92°0'40.23"	
	AP-12	20	SP+0		5°55'1"RT		45	803			24°7'53.32"	92°0'39.74"	
	LOC-12/1	21	SP+2.5	2.5			45	90					
	AP-13	22	DP+2.5	2.5	25°39'10"RT		45	893	LT, 11KV, BRICK ROAD		24°7'50.68"	92°0'37.99"	
	AP-14	23	DP+0		52°24'0"LT		45	938			24°7'49.86"	92°0'36.62"	
	LOC-14/1	24	SP+0				41	82					
	AP-15	25	SP+0		7°34'54"LT		33	1020		pkhari	24°7'47.22"	92°0'36.39"	
	LOC-15/1	26	SP+2.5	2.5			35	66					
	AP-16	27	DP+2.5	2.5	30°15'46"LT		20	1086	11KV		24°7'45.11"	92°0'36.51"	
	AP-17	28	DP+0		53°27'41"RT		20	1106			24°7'44.56"	92°0'36.9"	
	LOC-17/1	29	SP+0				45	90	VILL.ROAD				
	AP-18	30	DP+0		28°13'10"RT		45	1196			24°7'41.69"	92°0'35.76"	
	LOC-18/1	31	SP+0				45	135					
	LOC-18/2	32	SP+0				45						
	AP-19	33	DP+0		31°7'37"RT		40	1331			24°7'38.68"	92°0'32.06"	
	LOC-19/1	34	SP+0				40	80					
	AP-20	35	SP+0		3°56'19"LT		35	1411	132KV S/C AGT-KUM TR. LINE		24°7'38.24"	92°0'28.48"	
	LOC-20/1	36	SP+0				35	70					
	AP-21	37	SP+0		4°23'55"LT		41	1481			24°7'37.67"	92°0'27.07"	
	AP-22	38	DP+0		21°57'16"LT		41	1522		pkhari	24°7'37.24"	92°0'25.69"	
	LOC-22/1	39	SP+0				44	88					
	AP-23	40	DP+2.5	2.5	53°37'48"RT		52	1610					
	AP-24	41	FP+2.5	2.5	66°22'14"LT		30	1662	NH-44, 11KV		24°7'35.37"	92°0'23.34"	
	AP-25	42	DP+0		11°51'11"LT		30	1692			24°7'35.75"	92°0'21.53"	
	LOC-25/1	43	SP+2.5	2.5			38	83	VILL.ROAD		24°7'34.96"	92°0'20.89"	
	AP-26	44	DP+2.5	2.5	16°41'28"LT		41	1775	2NOS 11KV				
	AP-27	45	DP+2.5	2.5	29°29'13"LT		33	1816	BRICK ROAD		24°7'32.51"	92°0'19.67"	
	AP-28	46	DP+2.5	2.5	12°32'44"RT		33	1849	11KV LT, POND		24°7'31.18"	92°0'19.47"	
	AP-29	47	DP+2.5	2.5	37°40'13"RT		21	1882	11KV LT, POND		24°7'30.18"	92°0'19.9"	
	AP-30	48	DP+2.5	2.5	17°50'29"LT		21	1903	POND		24°7'29.1"	92°0'20.09"	
	LOC-30/1	49	SP+0				45		BRICK ROAD, POND		24°7'28.52"	92°0'19.74"	
	LOC-30/2	50	SP+0				45		POND				
	LOC-30/3	51	SP+0				45	225					PADDY LAND
	LOC-30/4	52	SP+0				45						

LINE NAME:-
PK.BARI 132/33 KV 5/5 TO 82MILE

DETAIL SURVEY POLE SCHEDULE

Sl. No.	AP/LOC	SP	DP	Angle	Dist	Remarks	Coordinates	Notes
106	LOC-56/1	SP+0			45			
107	AP-57	DP+0		17°48'46"RT	45	MRD, 11KV	24°5'26.5"	92°02'584"
108	LOC-57/1	SP+0			45			
109	LOC-57/2	SP+0			45			
110	LOC-57/3	SP+0			45			
111	AP-58	DP+0		10°23'45"LT	42		24°5'26.59"	91°59'56.88"
112	LOC-58/1	SP+0			45			
113	AP-59	DP+2.5	2.5	13°40'50"RT	32		24°5'26.19"	91°59'54.19"
114	LOC-59/1	SP+0			35			
115	AP-60	DP+0		27°17'30"LT	45		24°5'26.39"	91°59'51.18"
116	LOC-60/1	SP+2.5	2.5		32			
117	LOC-60/2	SP+2.5	2.5		45			
118	AP-61	DP+2.5	2.5	35°52'59"LY	44		24°5'24.84"	91°59'47.19"
119	LOC-61/1	SP+2.5	2.5		45			PADDY LAND
120	LOC-61/2	SP+0			45			PADDY LAND
121	LOC-61/3	SP+0			45			PADDY LAND
122	LOC-61/4	SP+0			45			PADDY LAND
123	LOC-61/5	SP+0			45			PADDY LAND
124	LOC-61/6	SP+0			45			PADDY LAND
125	AP-62	DP+0		14°20'48"RT	45		24°5'16.22"	91°59'41.51"
126	LOC-62/1	SP+2.5	2.5		45			
127	AP-63	SP+2.5	2.5	5°1'29"RT	33		24°5'14.12"	91°59'39.19"
128	LOC-63/1	SP+2.5	2.5		32			
129	AP-64	SP+2.5	2.5	6°28'45"LT	45		24°5'12.84"	91°59'37.5"
130	LOC-64/1	SP+0			45			
131	LOC-64/2	SP+0			45			
132	AP-65	DP+2.5	2.5	27°57'1"LT	37		24°5'9.541"	91°59'34.02"
133	LOC-65/1	SP+2.5	2.5		37			
134	AP-66	DP+0		54°21'7"LT	45		24°5'7.228"	91°59'33.3"
135	AP-67	DP+0		18°57'1"RT	42		24°5'5.773"	91°59'34.55"
136	LOC-67/1	SP+0			42			
137	AP-68	DP+0		37°37'25"RT	45		24°5'3.503"	91°59'35.42"
138	LOC-68/1	SP+0			45			
139	LOC-68/2	SP+0			45			
140	AP-69	SP+0		2°51'21"LT	45		24°5'59.26"	91°59'33.89"
141	LOC-69/1	SP+0			45			
142	LOC-69/2	SP+0			45			
143	LOC-69/3	SP+0	2.5		31			
144	AP-70	DP+0	2.5	21°40'57"LT	44		24°5'54.44"	91°59'32.44"
145	LOC-70/1	SP+0			44			
146	AP-71	DP+0		14°11'15"RT	45		24°5'51.58"	91°59'32.78"
147	LOC-71/1	SP+0			45			
148	LOC-71/2	SP+0			45			
149	LOC-71/3	SP+0			45			
150	AP-72	DP+2.5	2.5	10°59'26"LT	36		24°5'45.59"	91°59'31.87"
151	LOC-72/1	SP+2.5	2.5		36			
152	AP-73	DP+0		19°23'54"RT	45		24°5'43.48"	91°59'31.99"
153	LOC-73/1	SP+0			45			
154	AP-74	SP+0		6°8'39"RT	43		24°5'40.45"	91°59'31.03"
155	LOC-74/1	SP+0			45			
156	LOC-74/2	SP+0			45			

Co. Tripura

POWER GRID IGT



FEAR for T&D subprojects in Dhalai, Unakoti and North Tripura District under NERPSIP in Tripura



LINE NAME: PK.BARI 132/93 KV 5/5 TO 82MILE

AP/LOC	SP	DP	Angle	Dist	Station	Structure	Coordinates
AP-75	157	SP+0	8°57'56"RT	45	6446		24°5'36.67" 91°59'29.32"
AP-76	158	SP+0	6°30'58"RT	44	6490		24°5'35.46" 91°59'28.52"
LOC-76/1	159	SP+0		43		DUDHPUR	
LOC-76/2	160	SP+0		43	129		
AP-77	161	DP+0	25°36'59"LT	43	6619	11KVABRD	24°5'32.16" 91°59'25.71"
LOC-77/1	162	SP+0		45			
LOC-77/2	163	SP+2.5	2.5	45	131		
AP-78	164	DP+2.5	2.5	41	6750	MRD,11KV	24°5'27.99" 91°59'24.71"
LOC-78/1	165	SP+2.5	2.5	45	90	MRD	
AP-79	166	DP+2.5	2.5	45	6840	MRD,11KV	24°5'25.07" 91°59'25.45"
LOC-79/1	167	SP+2.5	2.5	39		MRD	
LOC-79/2	168	SP+2.5	2.5	39	121	MRD,11KV	
AP-80	169	DP+2.5	2.5	43	6961	MRD,11KV	24°5'22.45" 91°59'28.41"
AP-81	170	SP+0	1°46'45"LT	45	45	7006	MRD DUDHPUR 24°5'21.03" 91°59'28.74"
LOC-81/1	171	SP+0		34			
LOC-81/2	172	SP+0		31	99		
AP-82	173	SP+0	9°1'1"RT	45		7105	24°5'17.88" 91°59'29.57"
LOC-82/1	174	SP+0		45			
LOC-82/2	175	SP+0		45	173	MRD	
LOC-82/3	176	SP+0		45			
AP-83	177	SP+0	0°57'21"RT	38		7278	MRD namapara 24°5'12.29" 91°59'30.08"
AP-84	178	DP+0	18°17'52"RT	34	34	7312	MRD 24°5'11.18" 91°59'30.16"
AP-85	179	DP+0	10°17'23"RT	47	47	7359	MRD 24°5'9.722" 91°59'29.74"
LOC-85/1	180	SP+2.5	2.5	38		LT	
LOC-85/2	181	SP+0		40	152		
LOC-85/3	182	SP+0		33			
AP-86	183	FP+0	76°7'38"LT	41		7511	MRD namapara 24°5'5.221" 91°59'27.48"
LOC-86/1	184	SP+0		41	82		
AP-87	185	DP+0	15°46'19"RT	33	33	7593	24°5'3.545" 91°59'29.76"
AP-88	186	DP+0	13°19'58"RT	33	33	7626	24°5'2.672" 91°59'30.44"
AP-89	187	DP+0	14°40'35"RT	40	40	7669	namapara 24°5'1.375" 91°59'31.01"
LOC-89/1	188	SP+0		40	80		
AP-90	189	FP+0	75°34'9"LT	40		7749	
AP-91	190	SP+0	7°18'21"LT	30	30	7788	MRD,11KV,LT 24°4'58.77" 91°59'31.39"
LOC-91/1	191	SP+2.5	2.5	20		LT	24°4'58.62" 91°59'32.77"
AP-92	192	DP+0	17°52'59"LT	42	42	7850	BRICK ROAD 24°4'58.62" 91°59'33.77"
LOC-92/1	193	SP+0		37		NALA	24°4'58.4" 91°59'34.72"
LOC-92/2	194	SP+0		44	126		
AP-93	195	DP+2.5	2.5	45		LT	
AP-94	196	SP+2.5	2.5	30	30	7976	MRD,11KV,LT 24°4'59.02" 91°59'39.14"
AP-95	197	DP+0	14°12'28"RT	45	45	8006	24°4'58.86" 91°59'40.17"
AP-96	198	DP+0	00°00'00"	43	43	8051	24°4'58.84" 91°59'41.91"
						8094	24°4'58.46" 91°59'43.32"



33/11kV Chailengta (New) - LILO point of Chamamu-Manu Line- 0.92 Km

POWER-T.S.E.C.L
MENT-PGCIL

DETAIL SURVEY POLE SECEDURE

LINK NAME :- LILO of EXTING CHHAMAMU-MANU LINE AT CHAILENGTA(LOOP IN)

SL. NO	AP NO	POLE NO.	TYPE OF POLE	EXT. of Mt.	ANGLE OF DEVIATION	SPAN	SEC. LENGTH	CUMULV. LENGTH	CROSSING	VILLAGE NAME	GPS CO-ORDINATE(WGS-84)		REMARKS
											NORTHING	EASTING	
1	EXT		TOWER							UTTAR DHUMA CHERRA	23°56'19.7"	91°59'52.7"	
2	AP-1A	1A	FP+2.5	2.5	62°48'2"LT	53		53			23°57'20.3"	91°59'51.2"	
3		LOC-1A/1	SP+0	0		45							
4		LOC-1A/2	SP+0	0		30							
5	AP-1	1	SP+0	0	3°23'3"RT	30		158			23°56'18.5"	91°59'48.0"	
6		LOC-1/1	SP+0	0		45							
7		LOC-1/2	SP+0	0		45							
8		LOC-1/3	SP+0	0		45							
9		LOC-1/4	SP+0	0		45							
10		LOC-1/5	SP+0	0		45							
11	AP-2	2	DP+0	0	28°15'46"RT	38		431	FOOTPATH 11KV	UTTAR DHUMA CHERRA	23°56'14.3"	91°59'39.5"	
12		LOC-2/1	SP+0	0		40			POND				
13		LOC-2/2	SP+0	0		45							
14		LOC-2/3	SP+0	0		45							
15		LOC-2/4	SP+0	0		24			DITCH				
16	AP-3	3	DP+0	0	44°48'30"RT	47		635		UTTAR DHUMA CHERRA	23°56'14.3"	91°59'32.3"	
17		LOC-3/1	SP+2.5	2.5		45			VILL-ROAD.LT				
18	AP-4	4	DP+0	0	25°31'44"RT	59		727			23°56'16.4"	91°59'30.0"	
19	AP-5	5	DP+2.5	2.5	21°17'51"LT	40		786			23°56'18.2"	91°59'29.3"	
20		LOC-5/1	SP+0	0		33							
21	AP-6	6	DP+0	0	23°35'19"LT	50		859	BRICK ROAD	UTTAR DHUMA CHERRA	23°56'20.0"	91°59'27.6"	
22	AP-7	7	DP+0	0	00°00'00"	50		909			23°56'20.7"	91°59'26.0"	

Submitted by: **Pradip Mitra**, Sr. Engg. (Technobab Engg. Ltd)

Dr. General Manager, Transmission Division, Kumarghat (P.K. Bari)

Mr. Manager (Electrical Sub-Division) Manu, Dhalai, Tripura

APPROVED BY: **Dr. A. Das**, Sr. Manager, G.M. Powergrid, Kumarghat

DETAIL SURVEY POLE SECEDURE

LINK NAME :- LILO of EXTING CHHAMAMU-MANU LINE AT CHAILENGTA(LOOP IN)

SL. NO	AP NO	POLE NO.	TYPE OF POLE	EXT. of Mt.	ANGLE OF DEVIATION	SPAN	SEC. LENGTH	CUMULV. LENGTH	CROSSING	VILLAGE NAME	GPS CO-ORDINATE(WGS-84)		REMARKS
											NORTHING	EASTING	
1	EXT		TOWER		00°00'00"					UTTAR DHUMA CHERRA	23°56'29.59"	91°59'43.96"	
2	AP-1	1	FP+2.5	2.5	65°4'19"RT	15	15	15	METAL ROAD		23°56'29.13"	91°59'43.10"	
3		LOC-1/1	SP+0	0		40					23°56'27.7"	91°59'40.7"	
4	AP-2	2	DP+0	0	31°43'2"RT	35		95			23°56'28.4"	91°59'39.3"	
5	AP-3	3	DP+0	0	10°02'58"LT	48		128	METAL ROAD				
6		LOC-3/1	SP+0	0		45							
7		LOC-3/2	SP+0	0		45							
8	AP-4	4	SP+0	0	4°12'32"RT	44		270			23°56'26.8"	91°59'34.6"	
9		LOC-4/1	SP+0	0		44							
10	AP-5	5	SP+0	0	1°00'55"LT	33		358			23°56'26.4"	91°59'31.5"	
11		LOC-5/1	SP+0	0		33							
12	AP-6	6	SP+0	0	6°27'13"LT	36		431	SORA RIVER	UTTAR DHUMA CHERRA	23°56'26.5"	91°59'28.9"	
13		LOC-6/1	SP+0	0		36							
14	AP-7	7	SP+0	0	1°00'48"LT	36		503			23°56'26.12"	91°59'26.40"	
15		LOC-7/1	SP+0	0		40							
16	AP-8	8	DP+0	0	11°37'8"RT	31		583			23°56'25.74"	91°59'23.61"	
17	AP-9	9	FP+0	0	61°35'48"LT	29		614			23°56'25.80"	91°59'22.51"	
18	AP-10	10	SP+0	0	1°12'28"LT	47		643	METAL ROAD		23°56'24.9"	91°59'22.3"	
19	AP-11	11	DP+0	0	19°11'10"RT	28		690			23°56'23.4"	91°59'22.0"	
20	AP-12	12	SP+0	0	1°00'28"LT	29		718			23°56'22.6"	91°59'21.5"	
21	AP-13	13	FP+0	0	88°13'43"LT	29		747	2NOS BRICK ROAD		23°56'21.8"	91°59'21.0"	
22	AP-14	14	DP+0	0	11°49'35"LT	43		790			23°56'21.2"	91°59'22.0"	
23		LOC-14/1	SP+0	0		30							
24	AP-15	15	SP+0	0	9°32'28"RT	36		853			23°56'20.37"	91°59'24.39"	
25	AP-16	16	FP+0	0	69°45'18"LT	28		892	BRICK ROAD	UTTAR DHUMA CHERRA	23°56'19.73"	91°59'25.60"	
26	AP-17	17	DP+0	0		28		920			23°56'20.32"	91°59'26.37"	

Submitted by: **Pradip Mitra**, Sr. Engg. (Technobab Engg. Ltd)

Dr. General Manager, Transmission Division, Unakoti, Tripura

Mr. Manager (Electrical Sub-Division) Manu, Dhalai, Tripura

APPROVED BY: **Dr. A. Das**, Sr. Manager, G.M. Powergrid, Kumarghat

Handwritten notes on the right side of the table:

1. The schedule of the normal spans in this area is as follows: 40m, 45m, 50m, 55m, 60m, 65m, 70m, 75m, 80m, 85m, 90m, 95m, 100m, 105m, 110m, 115m, 120m, 125m, 130m, 135m, 140m, 145m, 150m, 155m, 160m, 165m, 170m, 175m, 180m, 185m, 190m, 195m, 200m, 205m, 210m, 215m, 220m, 225m, 230m, 235m, 240m, 245m, 250m, 255m, 260m, 265m, 270m, 275m, 280m, 285m, 290m, 295m, 300m, 305m, 310m, 315m, 320m, 325m, 330m, 335m, 340m, 345m, 350m, 355m, 360m, 365m, 370m, 375m, 380m, 385m, 390m, 395m, 400m, 405m, 410m, 415m, 420m, 425m, 430m, 435m, 440m, 445m, 450m, 455m, 460m, 465m, 470m, 475m, 480m, 485m, 490m, 495m, 500m, 505m, 510m, 515m, 520m, 525m, 530m, 535m, 540m, 545m, 550m, 555m, 560m, 565m, 570m, 575m, 580m, 585m, 590m, 595m, 600m, 605m, 610m, 615m, 620m, 625m, 630m, 635m, 640m, 645m, 650m, 655m, 660m, 665m, 670m, 675m, 680m, 685m, 690m, 695m, 700m, 705m, 710m, 715m, 720m, 725m, 730m, 735m, 740m, 745m, 750m, 755m, 760m, 765m, 770m, 775m, 780m, 785m, 790m, 795m, 800m, 805m, 810m, 815m, 820m, 825m, 830m, 835m, 840m, 845m, 850m, 855m, 860m, 865m, 870m, 875m, 880m, 885m, 890m, 895m, 900m, 905m, 910m, 915m, 920m, 925m, 930m, 935m, 940m, 945m, 950m, 955m, 960m, 965m, 970m, 975m, 980m, 985m, 990m, 995m, 1000m.

Addendum I

Study of 33/11 kV Jawahar Nagar (New) - 33/11 kV Dhumachhera (new) 33 kV line

1. 33 kV DL Jawaharnagar – Dhumachhera Details

The proposed DL 33 kV Jawaharnagar – Dhumachhera was earlier not considered in the FEAR II study as a component of the project. However, as a ground survey and feature study is completed for the line, the line study is presented here as an addendum to the FEAR II.

2. Project Progress with Respect to 33 kV DL Jawaharnagar – Dhumachhera

The total length of the DL is 23 km. The Line is having 21.33 Ha of RF. Stage-I was issued on 28.06.2021. Working permission is obtained on 29.09.21. Please see Enclosure 1. The status shows that no work is being started.

3. Feature Details of Final Route Alignment of 33/11 kV Jawahar Nagar (New) - 33/11 kV Dhumachhera (new) 33 kV line

33/11 kV Jawahar Nagar (New) - 33/11 kV Dhumachhera (new) 33 kV line covers 23 km distance. Total 133 electric poles (EP) are proposed in this DL. The DL is finalized after detailed analysis considering the environmental features like Forest / PA / River etc. The feature survey along the TL is carried out considering 15 mt ROW width i.e., 7.5 mt on either side from the centre line of the corridor. Geomorphological studies observed that the geology of the project area is majorly having primary rock structure of Less dissected Denudational Hills, Moderate Valley Fill, and moderately dissected structurally hills. Rock type comprises conglomerate of sandstone and pebble bed, at some locations sandstone with shale bands / coal bands / limestone bands along with Alluvium-sand/ silt & clay alternating beds.

Major part of the TL passes through plain agricultural fields (11.02%), open forest (35.65%), open scrub land (8.36%), Rubber and Orchard Plantation (9.81%) and Tree Crops and Groves (8.21%). The DL do not cross any National Highway and Power line. However, DL crosses Railway Line, brick kilns / quarry, metal roads, pond / lake etc. The DL route involves RF land of about 21.33 Ha area which has necessitated forest clearance under Forest (Conservation) Act, 1980. Stage I approval is obtained on 28th June 2021 and Working permission obtained on 29th September 2021. Besides all PA like NP, WLS and designated wildlife / elephant passage have been completely avoided. The landslide study during electric line feature survey and GIS mapping, reveals that the project region is very less vulnerable to landslide. The project area is moderately vulnerable to flood. The details are Depicted in **Enclosure 2**. The type of hazard for the project line is recorded as earthquake, windstorm and flood.

As per detailed surveys and GIS imagery data, ROW crosses water bodies such as rivers, ponds. DL crosses river Dhalai between EP 75 and 76, EP 48 and 49 and 50. All EPs are planned along the existing roadside/metal road. All the pole locations are easily accessible through existing roads to carry out construction and maintenance activities.

EPs are constructed well above the ground level at the required elevation helps to keep the people and animals away from EMF contact. It also prevents the structure from getting damaged during flood situations.

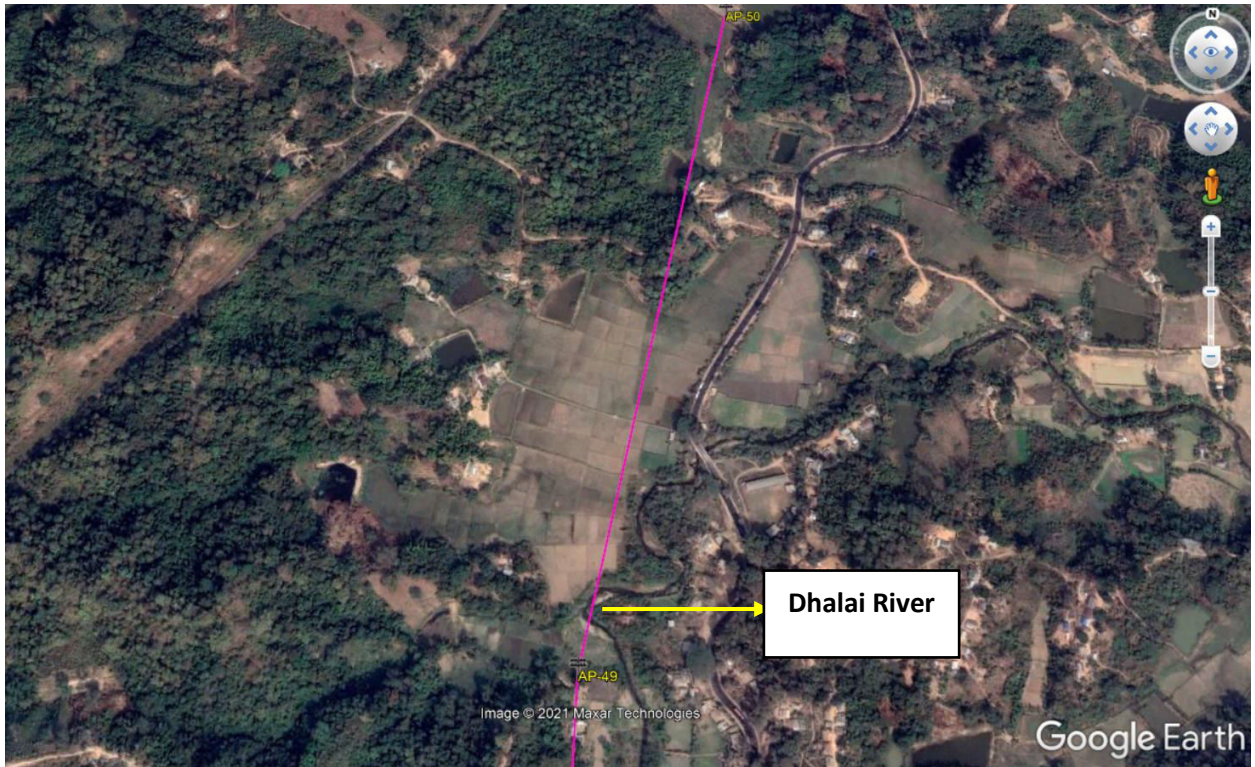
The major feature details are depicted in **Table 1**. The Google earth image of DL is provided in **Map 1**. DL feature details and GIS route survey map are provided in **Enclosure 2 and 3**.

**Table 1: kV line from 33/11 kV Jawahar Nagar (New) - 33/11 kV Dhumachhera (new) 33 kV line
Electric Line Feature Details-15m ROW**

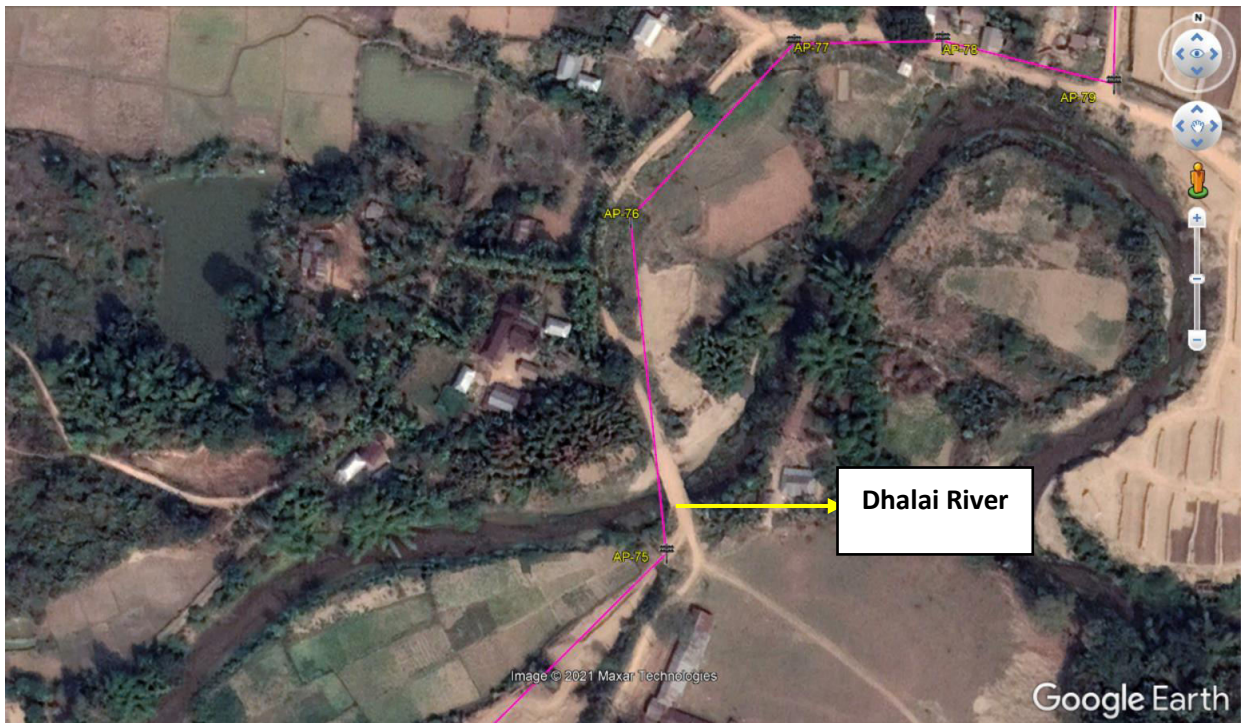
Feature Class Details	Area In Ha.	% Of Area
Agriculture Land	3.42	11.02%
Brick kilns/Quarry	0.12	0.39%
Bricks Road	1.89	6.09%
Bridge	0.03	0.09%
Drain/Nala	0.07	0.23%
Electric Substation	0.34	1.10%
Fallow Land	0.85	2.74%
Metal Road	0.72	2.33%
Mud Road	0.29	0.92%
Open Forest	11.07	35.65%
Open Scrub Land	2.60	8.36%
Pond/Lake	0.49	1.57%
Railway	0.02	0.05%
River	0.09	0.30%
Road Side Fallow Land	1.36	4.37%
Rubber Plantation/Orchards	3.05	9.81%
Tree Crop and Groves	2.55	8.21%
Vacant Land	2.10	6.77%
Total	31.05	100%



DL Crossing Dhalai River Between EP 48 and 49

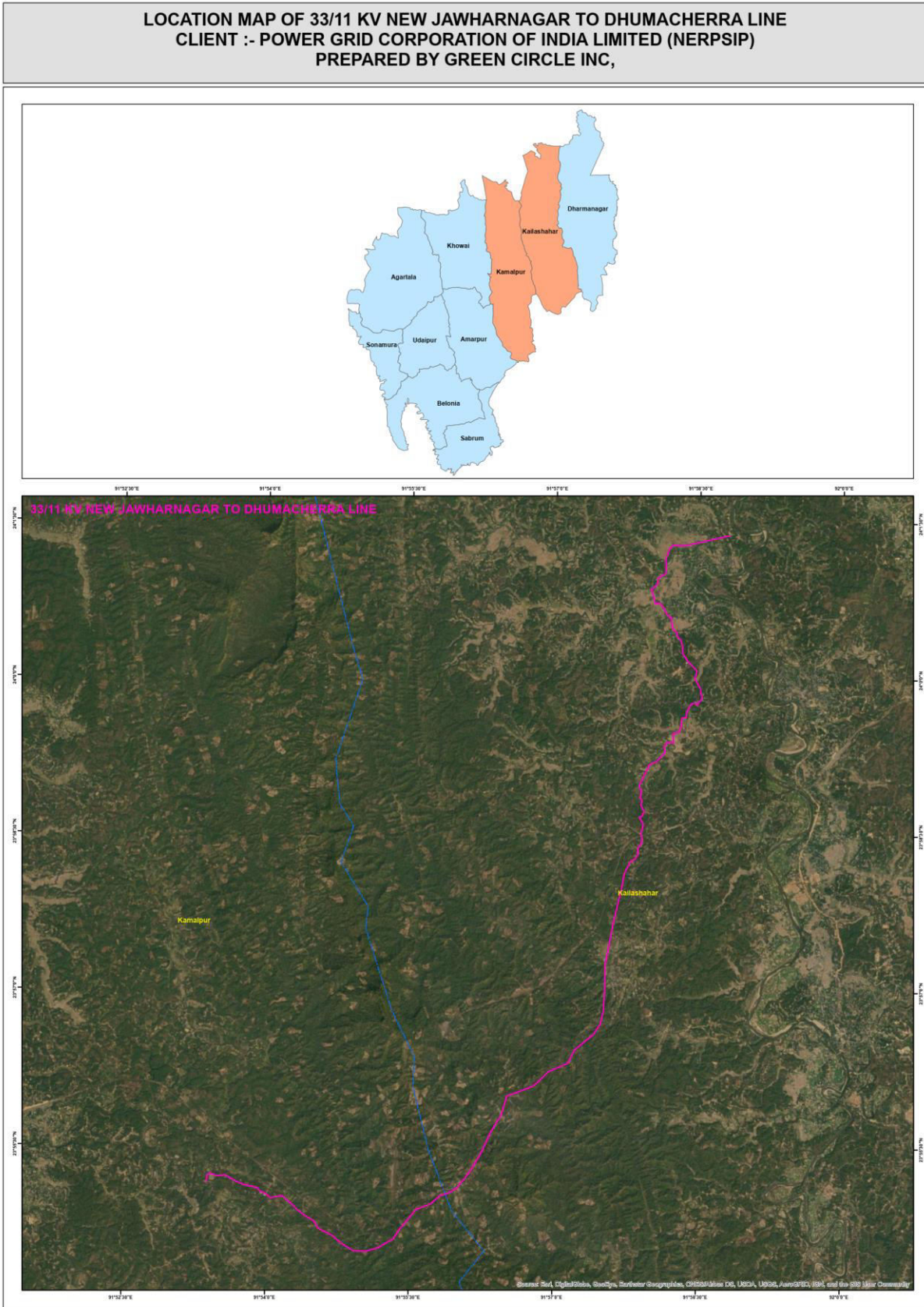


DL Crossing Dhalai River Between EP 49 and 50



DL Crossing Dhalai River Between EP 75 and 76

Map1: Google Earth Alignment Map of 33/11 kV Jawahar Nagar (New) - 33/11 kV Dhumachhera (new) 33 kV line



4. Total Land for Pole Base

Type and land use of 33/11 kV Jawahar Nagar (New) - 33/11 kV Dhumachhera (new) 33 kV line is discussed in Section 3 above and depicted in **Table 1**. Total 133 Poles are expected to be raised in this Line. The Impact assessment study i.e., Actual Land Loss because of Pole Base is estimated as below;

Total Length of DL: 23 Km

Total Poles planned: 133

The criteria of Pole base area calculation are 0.09 sq.mt / pole

Therefore, Total land loss area for tower & pole base (sq. mt.) = $0.09 \times 133 = 11.97$ Sq.mt

5. Compensatory Afforestation

Compensatory afforestation has been raised by Forest department over the double area diverted in case of 33 kV Jawaharnagar - Dhumachhera involving diversion of forest area of 21.33 ha. CA is being raised and maintained by Forest department over the double area diverted i.e., 42.67 Ha of degraded forest land identified in Mouja Paschim Nulicherra, CS Plot No. 01 (P), Rev. Khaitan No. 2/22, Ambassa Range, Ambassa Forest Sub-division in Dhalai District.

Enclosure 1:

Forest Clearance Obtained for 33 kV Jawaharnagar – Dhumachhera



भारत सरकार
GOVERNMENT OF INDIA
एकीकृत क्षेत्रीय कार्यालय
INTEGRATED REGIONAL OFFICE
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
लॉड सीब लुम्बतंगेन/LAW-U-SIB, LUMBATNGEN,
शिलोंग/SHILLONG-793021
TEL. 0364-2537278; FAX. 0364-2536041
E-mail: moefro.shillong@gov.in



F.No. 3 TR C 020/2021-SHI/631-32

28.06.2021

सेवा मे,

सचिव/Secretary,

त्रिपुरा सरकार/ Government of Tripura

पर्यावरण और वन विभाग /Department of Environment & Forests,

कुंजावन, अगरतला/ Kunjaban, Agartala.

Sub : Proposal for diversion of 21.3339 ha of Forest Land for construction of 33 KV Pole line from Jawaharnagar Sub-station to Dhumachera Sub-station under NERPSIP Tripura, DFO Dhalai-Tripura.

Sir,

This has got reference to the State Government of Tripura letter No. F.6-1282/FC/For-2020/1831-34 dated 16, March, 2021 on the subject mentioned above seeking prior approval of the Central Government under Section-2 of the Forest (Conservation) Act, 1980.

2. After careful examination of the proposal of the State Government of Tripura and the additional information submitted vide their letter No.F.6-1282/FC/For-2020/210-11 dated 02.06.2021 the proposal was discussed in the Regional Empowered Committee (REC) in its meeting held on 09.06.2021, the **In-principle / Stage-I approval** of the Central Government is hereby granted for diversion Proposal for diversion of 21.3339 ha of Forest Land for construction of 33 KV Pole line from Jawaharnagar Sub-station to Dhumachera Sub-station under NERPSIP Tripura, DFO Dhalai-Tripura subject to the following conditions:

A: Conditions which need to be complied prior to handing over of forest land by the State Forest Department.

1. The user agency shall transfer, the Net Present Value (NPV) of the forest land being diverted under this proposal, as per the orders of the Hon'ble Supreme Court of India dated 28/03/2008, 24/04/2008 and 09/05/2008 in Writ petition (Civil) No. 202/1995 and as per the guidelines issued by the Ministry vide letters No 5-3/2007-FC dated 05.02.2009. The requisite funds shall be transferred through online portal into CAMPA account of the State concerned;
2. The user agency shall transfer the cost of raising and maintaining the compensatory afforestation at the current wage rate in consultation with State Forest Department in the account of CAMPA of the concerned State through online portal. The scheme may include appropriate for anticipated cost increase for works scheduled for subsequent years;
3. The user agency shall transfer the cost of raising dwarf plantation with the State Forest Department;

01

4. Acceptability of DSS report of Compensatory Afforestation land as and when received from FSI, Dehradun after being found satisfactory by IRO, Shillong.
5. The boundary of the diverted forest land, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS co-ordinates;
6. All the funds received from the user agency under the project shall be transferred/deposited to CAMPA account only through e-portal(<https://parivesh.nic.in>). Amount deposited through other mode will not be accepted as compliance of the Stage-I clearance;
7. The cost of felling of trees shall be deposited by the User Agency with the State Forest Department;
8. The user agency shall deposit Rs.5 for upgradation of depot for keeping timber etc. extracted during implementation of project.
9. The user agency shall deposit an amount equivalent to that loss of the existing plantation i.e. 2.31 over double the area lost i.e. 4.62 ha with the State Forest Department.
10. The complete compliance of the FRA, 2006 shall be ensured by way of prescribed certificate from the District Collector;
11. Violation of any of these conditions will amount to violation of Forest(Conservation) Act, 1980 and action would be taken as prescribed in para 1.21 of Chapter 1 of the Handbook of comprehensive guidelines of Forest(Conservation) Act, 1980 as issued by this Ministry's letter No. 5-2/2017-Fc dated 28.03.2019;
12. The compliance report shall be uploaded on e-portal (<https://parivesh.nic.in/>);

B: Conditions which need to be strictly complied on field after handing over of forest land to the user agency by the State Forest Department but the compliance in form of undertaking shall be submitted prior to Stage-II approval:

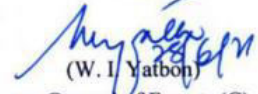
1. Legal status of the diverted forest land shall remain unchanged;
2. Compensatory Afforestation shall be raised over 42.67 ha degraded forest land in CS Plot No. 01 (P), Rev.Khatian No. 2/22, of Mouja Paschim Nulicherra, Ambassa Range, Ambassa Forest Sub-Division in Dhalai District.
3. At the time of payment of the Net Present Value (NPV) at the then prevailing rate, the User Agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;

4. All other clearances / NOCs under different rules / regulations / local laws and under Forest Dwellers (Recognition of Forest Rights) Act, 2006 as required vide MoEF, New Delhi guideline No. 11-9/98-FC(Pt) dated 05.02.2013 shall be complied with;
5. The User Agency at its cost shall provide bird deflectors, which are to be fixed on upper conductor of transmission line at suitable intervals to avoid bird hits;
6. The User Agency shall comply with the guidelines for laying transmission through forest areas issued by Ministry vide letter no. 7-25/2012-FC dated 05/05/2014 & 19/11/2014;
7. The User Agency shall obtain the Environmental Clearance under Environment (Protection) Act, 1986, if applicable;
8. The lay out of the proposal shall not be changed without the prior approval of the Central Government;
9. No labour camps shall be established on the forest land;
10. Sufficient firewood, preferably the alternative fuel, shall be provided by the User Agency to the labourer after purchasing the same from the State Forest Department or the Forest Development Corporation or any other legal source of alternative fuel;
11. The boundary of the diverted forest land shall be suitably demarcated on ground at the project cost, as per the directions of the concerned Divisional Forest Officer;
12. No additional or new path will be constructed inside the forest area for transportation of construction materials for execution of the project work;
13. The period of diversion under this approval shall be co-terminus with the period of lease to be granted in favour of the user agency or the project life, whichever is less;
14. The forest land shall not be used for any purpose other than that specified in the project proposal.
15. The User Agency and the State Government shall ensure compliance of all the Court orders, provisions, rules, regulations and guidelines for the time being in force as applicable to the project;
16. The User Agency will have to obtain the Forest (Conservation) Act, 1980 clearance for removal, if any, of stone, river sand, river boulders in forest land;

17. The forest land proposed to be diverted shall under no circumstances be transferred to any other agencies, department or person without prior approval of Govt. of India;

3. After receipt of the compliance report from the State Government on fulfilment of the conditions mentioned above, final approval will be issued in this regard. Formal transfer of forest land shall not be effected by the State Govt till final approval is granted by the Central Government.

भवदीय,




(W. I. Yatbon)

उप वन महानिरीक्षक (केंद्रीय) / Deputy Inspector General of Forests (C)

Copy to:

1. प्रधान मुख्य वन संरक्षक, त्रिपुरा सरकार, पर्यावरण और वन विभाग, कुंजावन, अगरतला /
Principal Chief Conservator of Forests, Govt. of Tripura, Department of Environment & Forests,
Kunjaban, Agartala.



उप वन महानिरीक्षक (केंद्रीय) / Deputy Inspector General of Forests (C)

o/c



FEAR for T&D subprojects in Dhalai, Unakoti and
North Tripura District under NERPSIP in Tripura
Addendum I

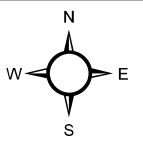
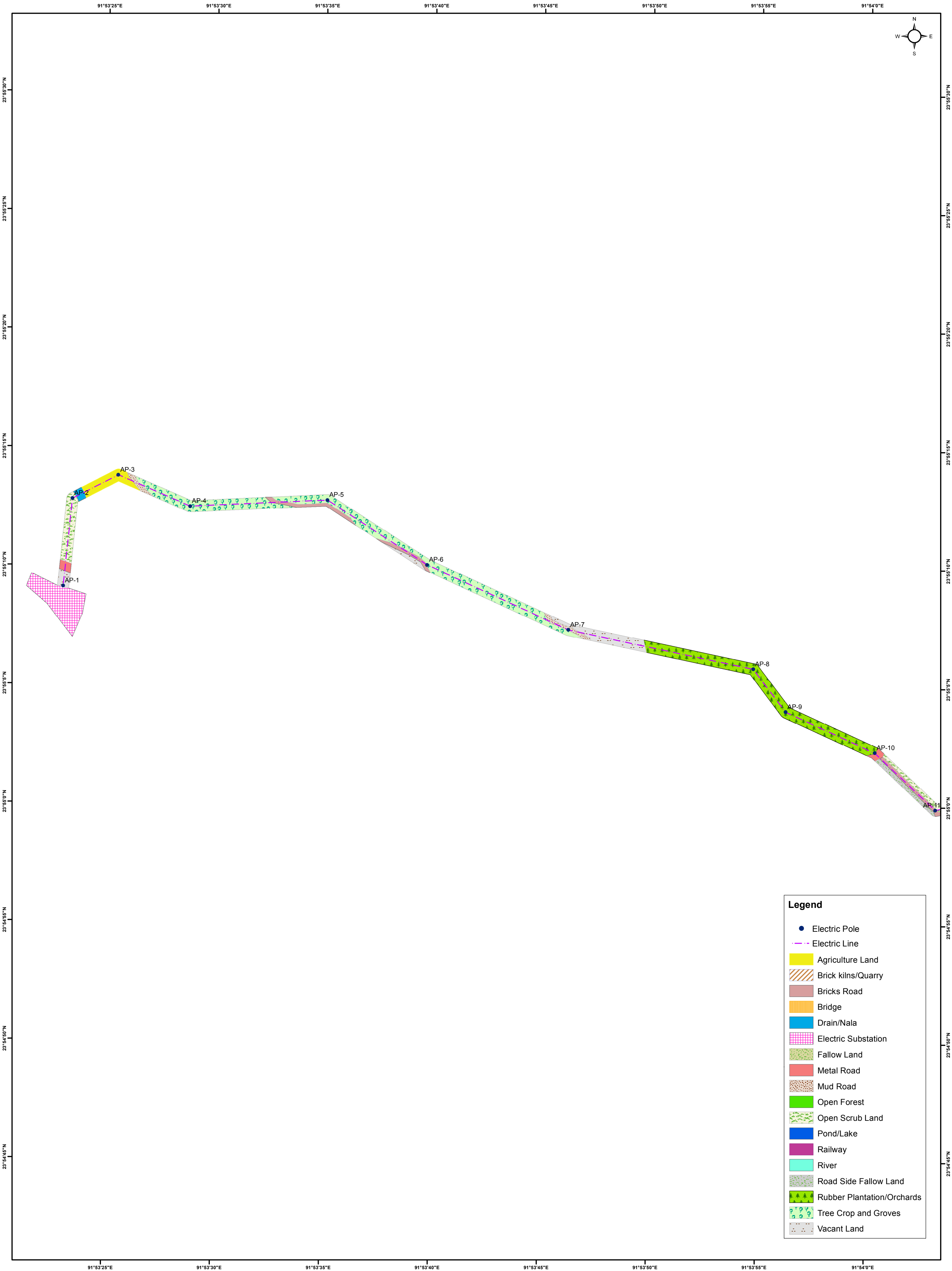


Enclosure 2:

Electric Line Feature Study of 33 kV Jawaharnagar Dhumachhera DL

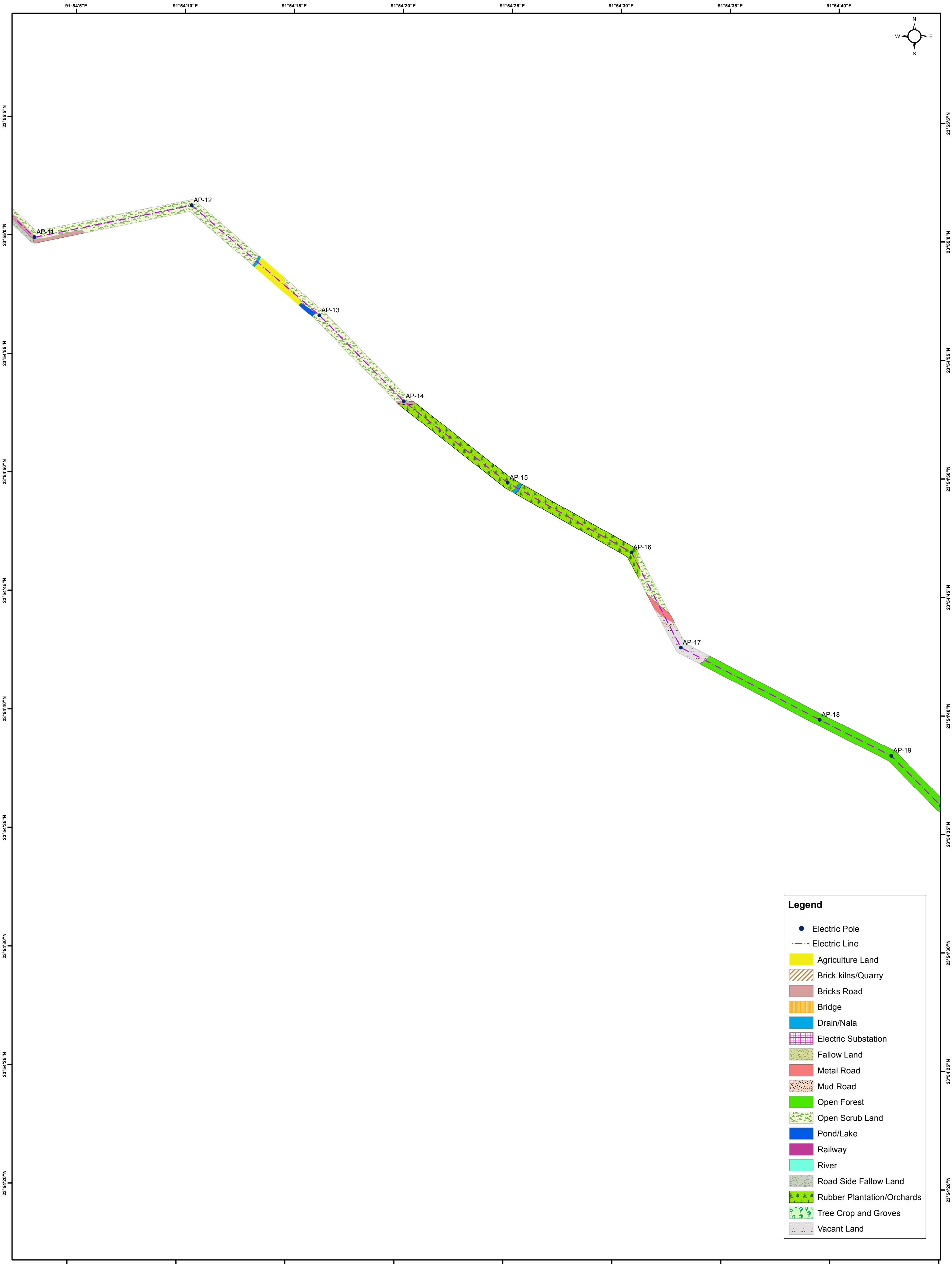
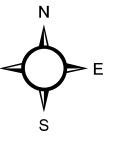
Enclosure 3

LAND USE/LAND COVER DETAILS OF 33/11 KV NEW JAWHARNAGAR TO DHUMACHERRA LINE
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED (NERPSIP)
PREPARED BY GREEN CIRCLE INC,



- Legend**
- Electric Pole
 - Electric Line
 - Agriculture Land
 - ▨ Brick kilns/Quarry
 - Bricks Road
 - Bridge
 - Drain/Nala
 - Electric Substation
 - Fallow Land
 - Metal Road
 - Mud Road
 - Open Forest
 - Open Scrub Land
 - Pond/Lake
 - Railway
 - River
 - Road Side Fallow Land
 - Rubber Plantation/Orchards
 - Tree Crop and Groves
 - Vacant Land

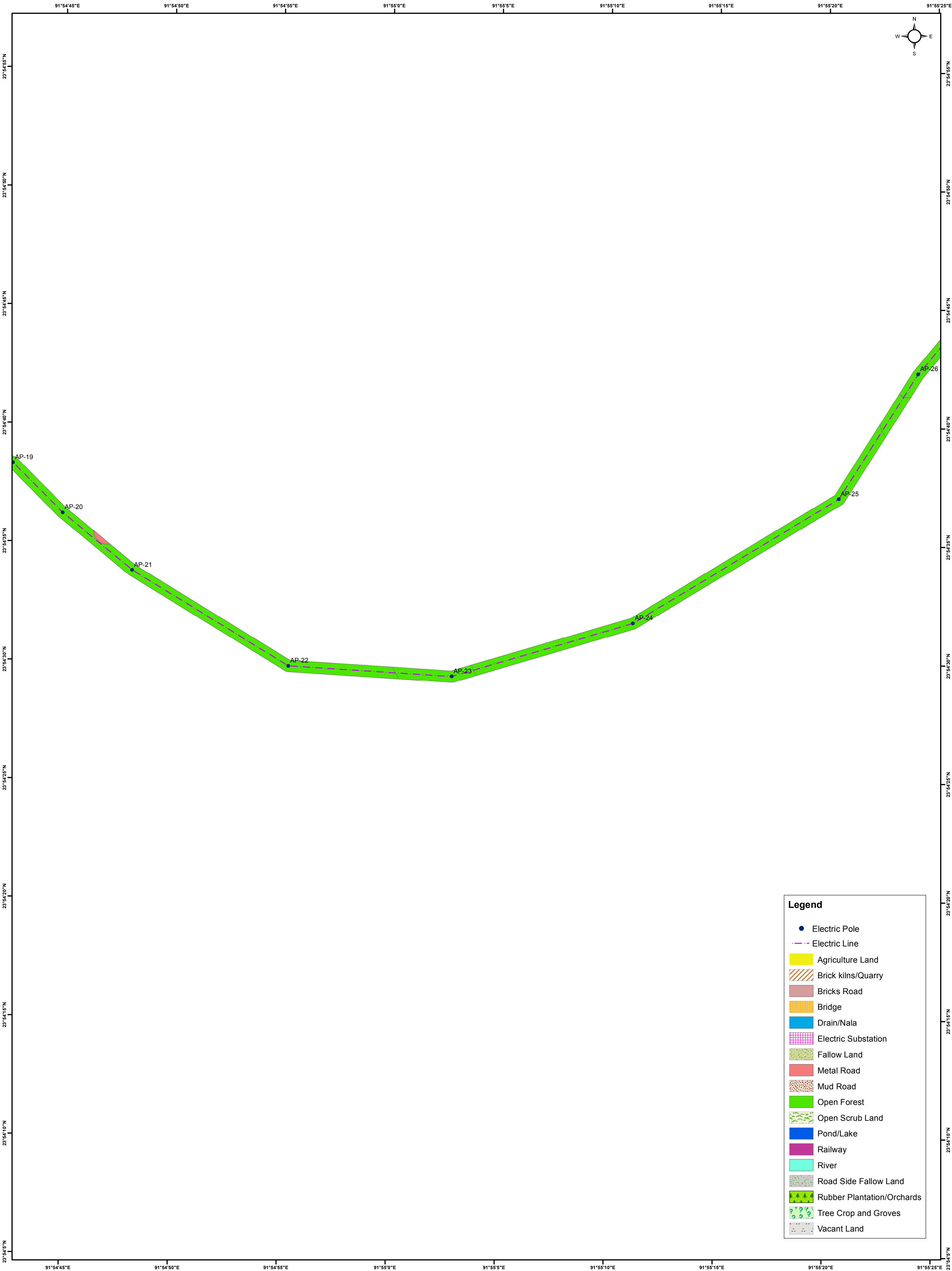
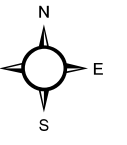
LAND USE/LAND COVER DETAILS OF 33/11 KV NEW JAWHARNAGAR TO DHUMACHERRA LINE
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Legend

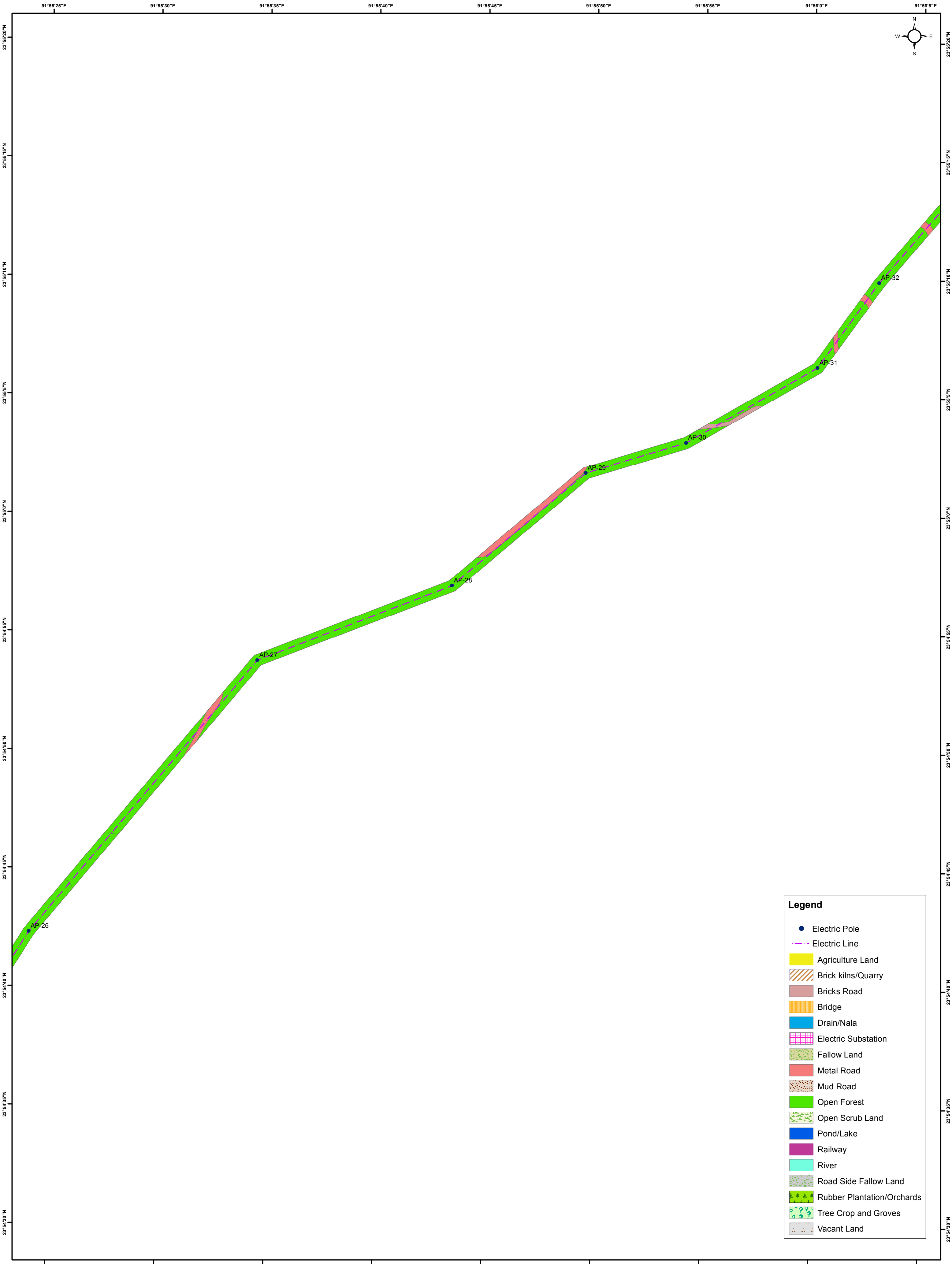
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- Electric Line
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 - Pond/Lake
 - Railway
 - River
 - Road Side Fallow Land
 - Rubber Plantation/Orchards
 - Tree Crop and Groves
 - Vacant Land

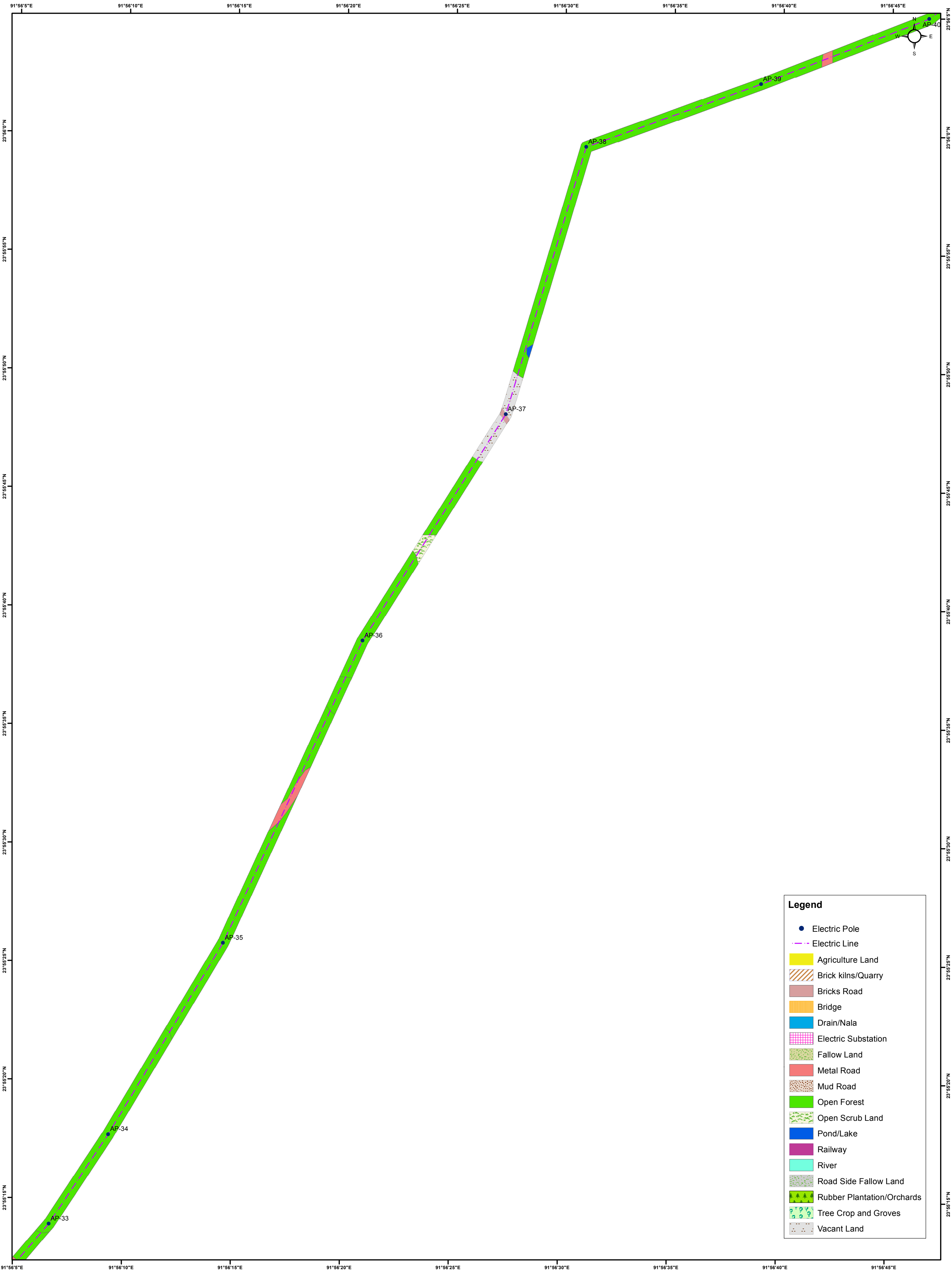
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Legend

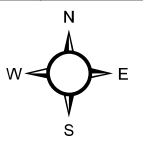
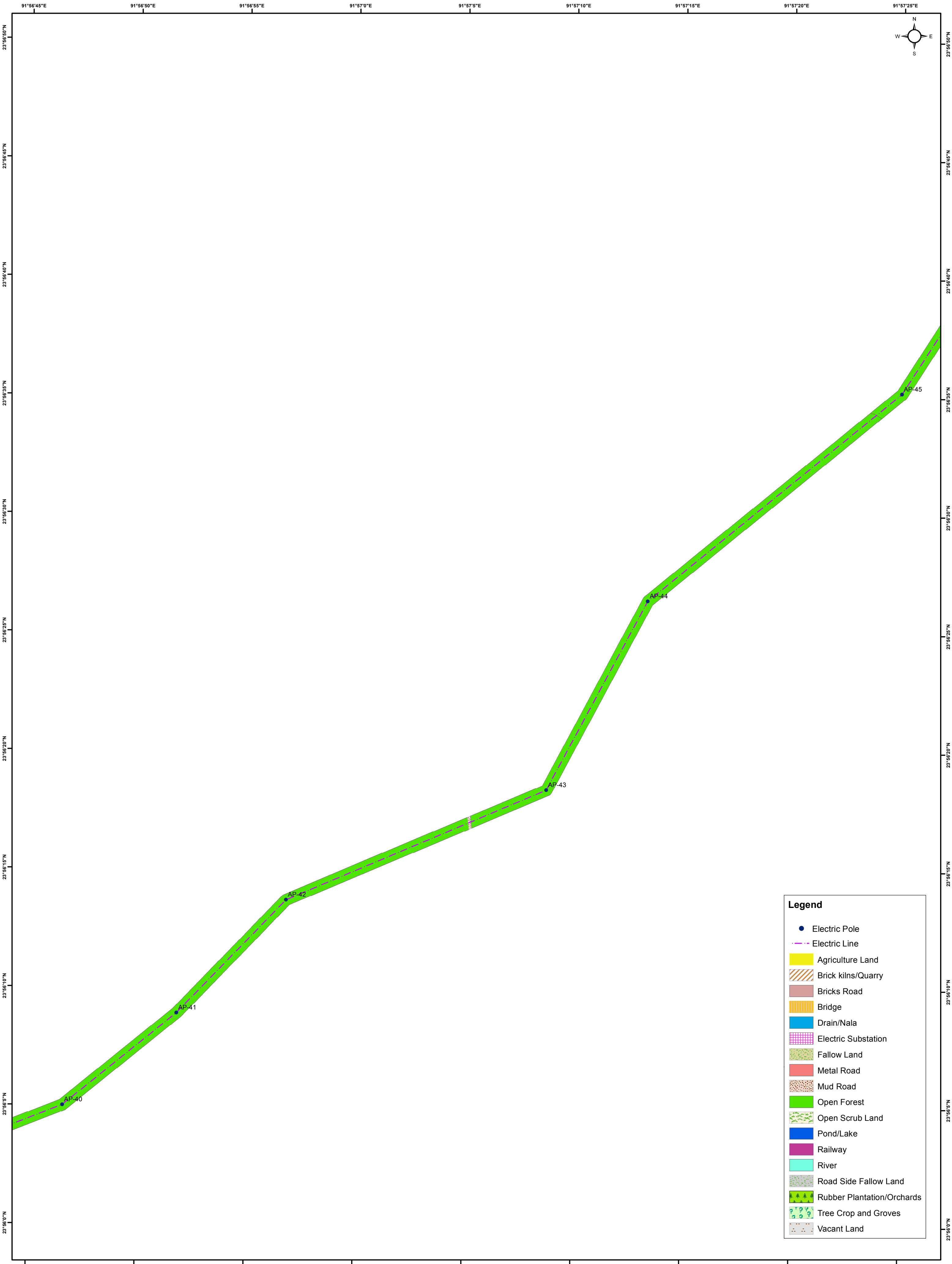
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LAND USE/LAND COVER DETAILS OF 33/11 KV NEW JAWHARNAGAR TO DHUMACHERRA LINE
CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED (NERPSIP)
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Legend	
●	Electric Pole
---	Electric Line
■ (Yellow)	Agriculture Land
■ (Diagonal Lines)	Brick kilns/Quarry
■ (Brown)	Bricks Road
■ (Orange)	Bridge
■ (Blue)	Drain/Nala
■ (Grid Pattern)	Electric Substation
■ (Green Dotted)	Fallow Land
■ (Red)	Metal Road
■ (Brown Dotted)	Mud Road
■ (Light Green)	Open Forest
■ (Green Dotted)	Open Scrub Land
■ (Blue)	Pond/Lake
■ (Purple)	Railway
■ (Cyan)	River
■ (Grey Dotted)	Road Side Fallow Land
■ (Green with Trees)	Rubber Plantation/Orchards
■ (Green with Trees)	Tree Crop and Groves
■ (Grey Dotted)	Vacant Land

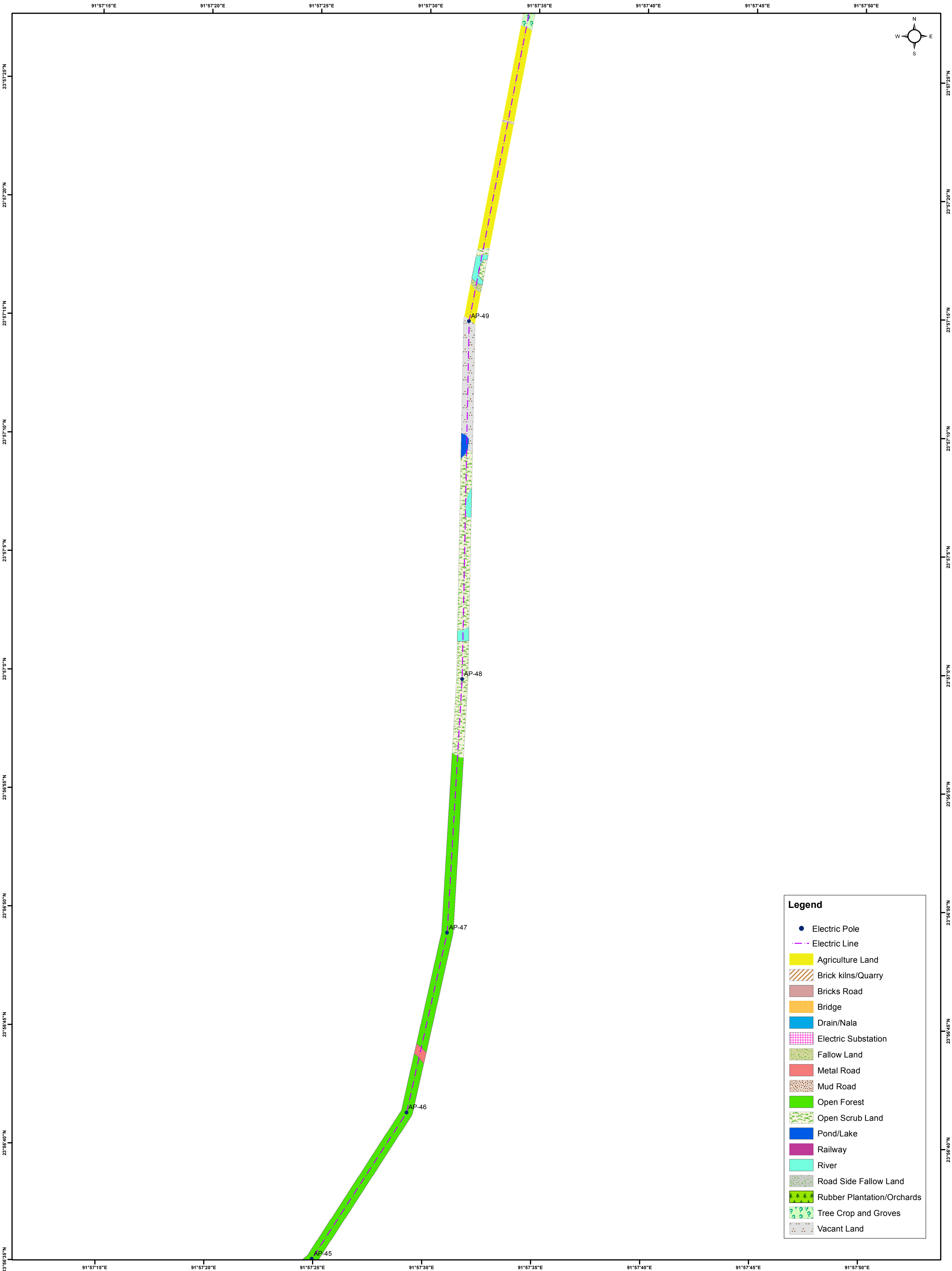
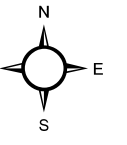
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Legend

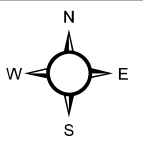
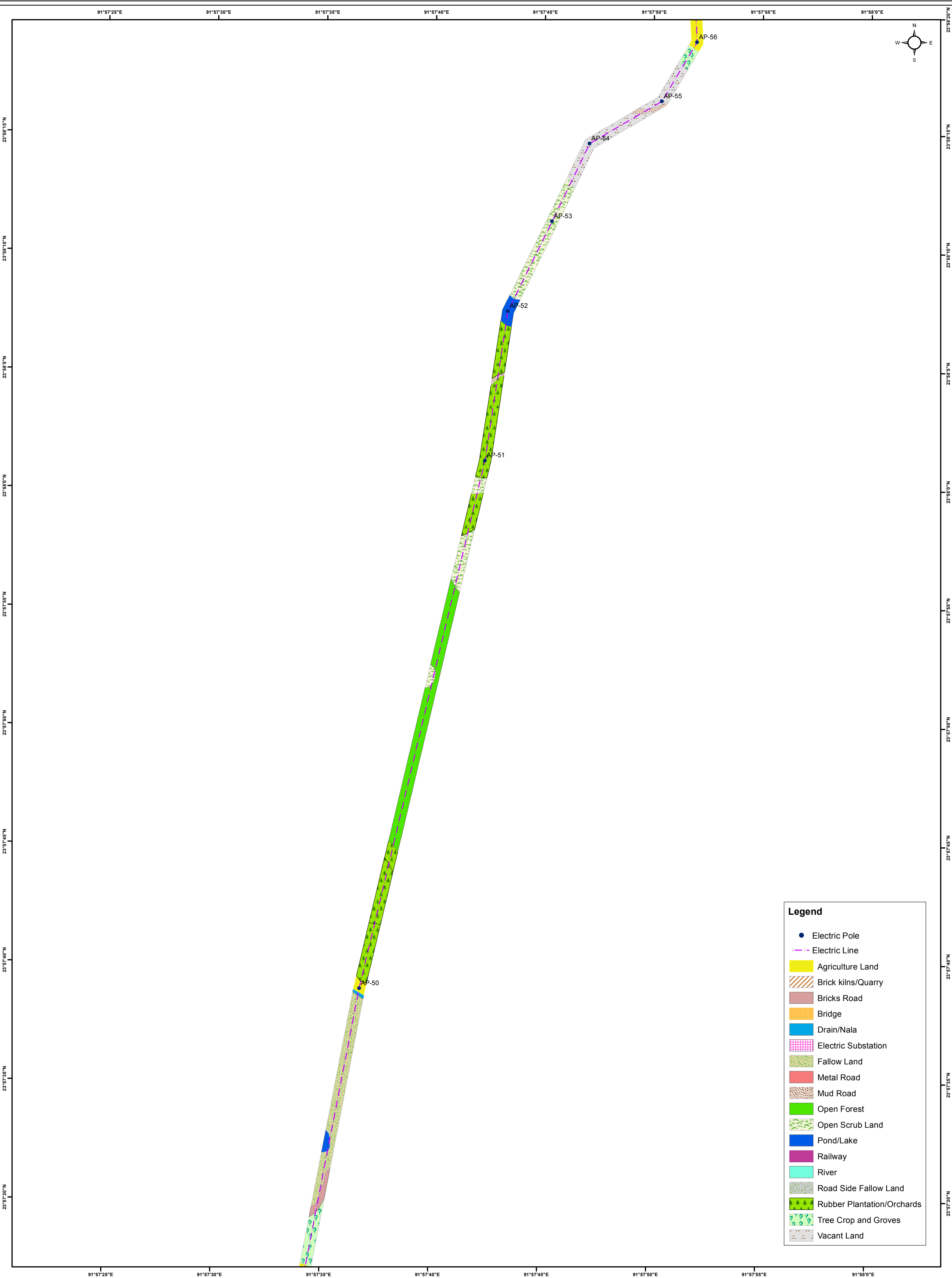
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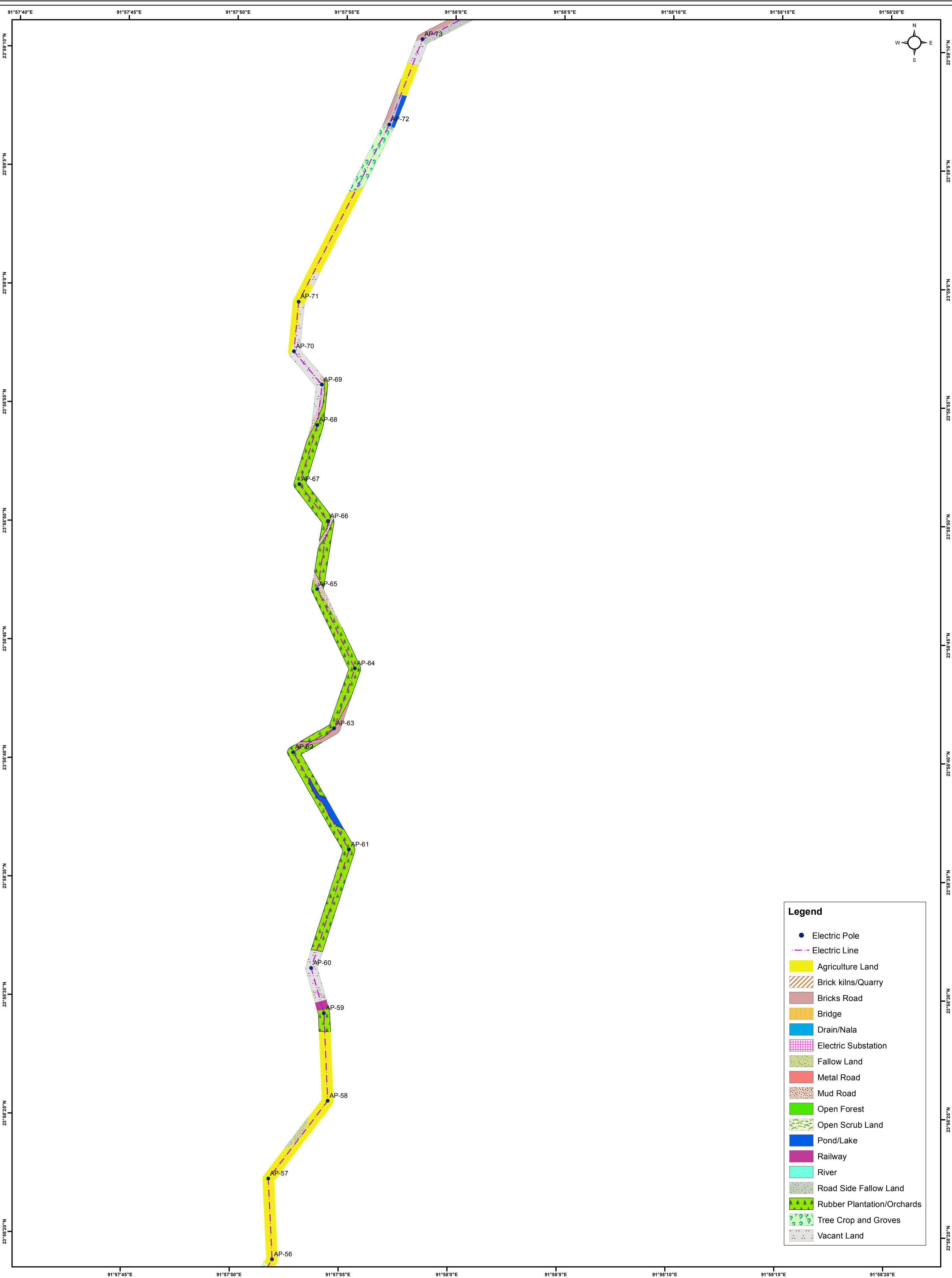
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	Bridge
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	Electric Substation
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	Open Forest
	Open Scrub Land
	Pond/Lake
	Railway
	River
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	Tree Crop and Groves
	Vacant Land

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■	Vacant Land

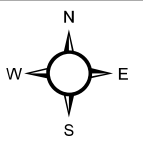
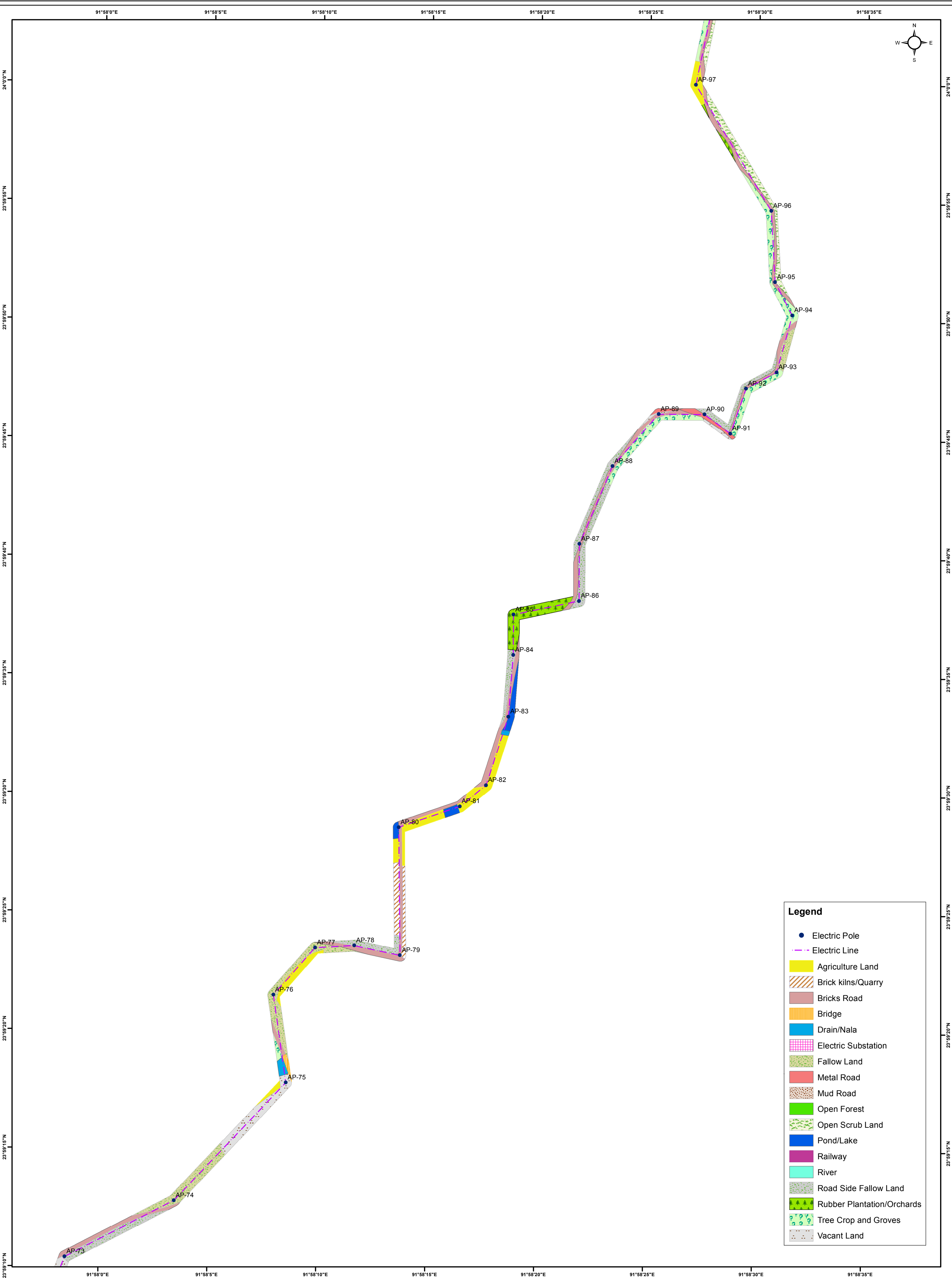
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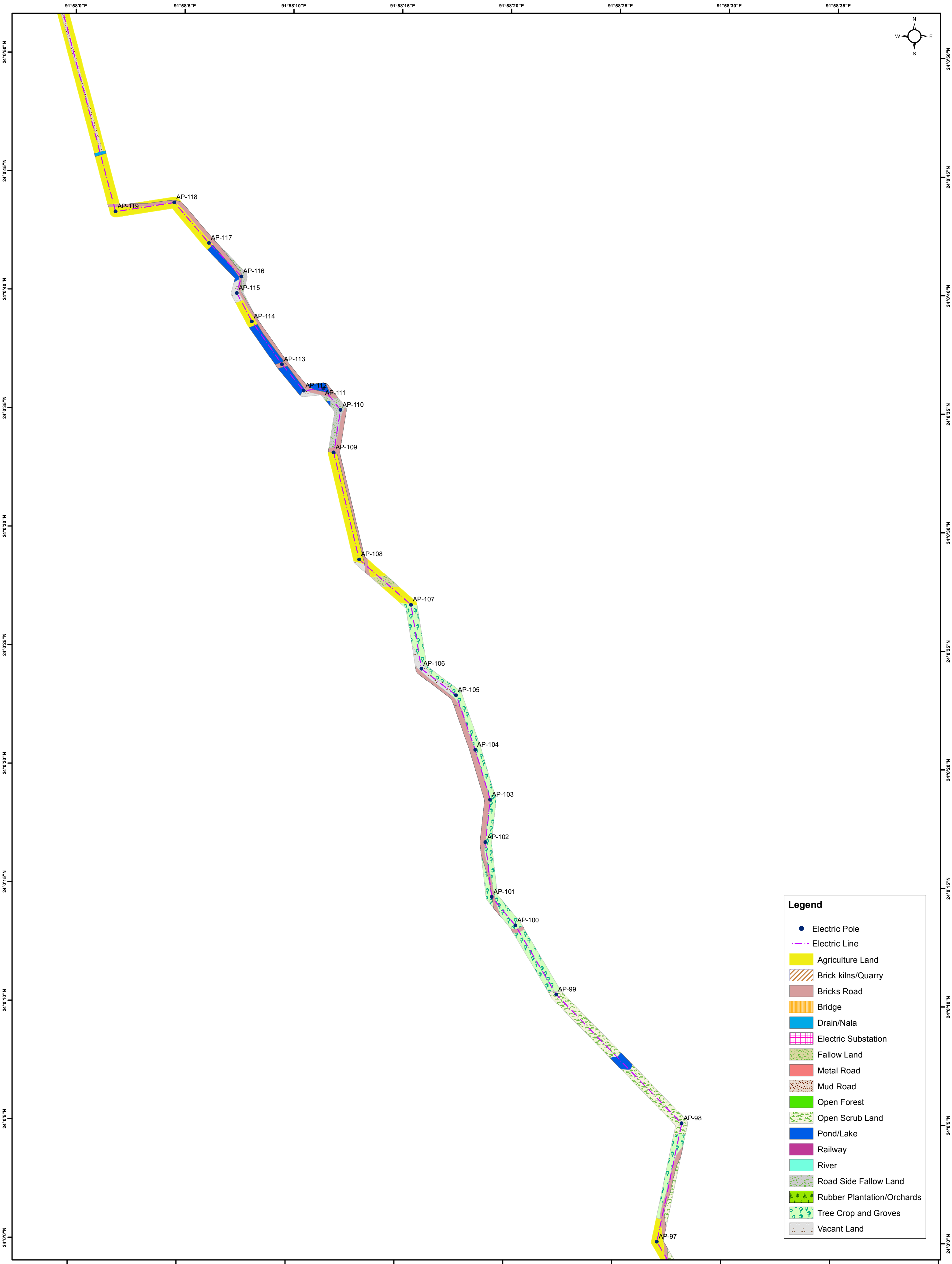
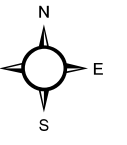
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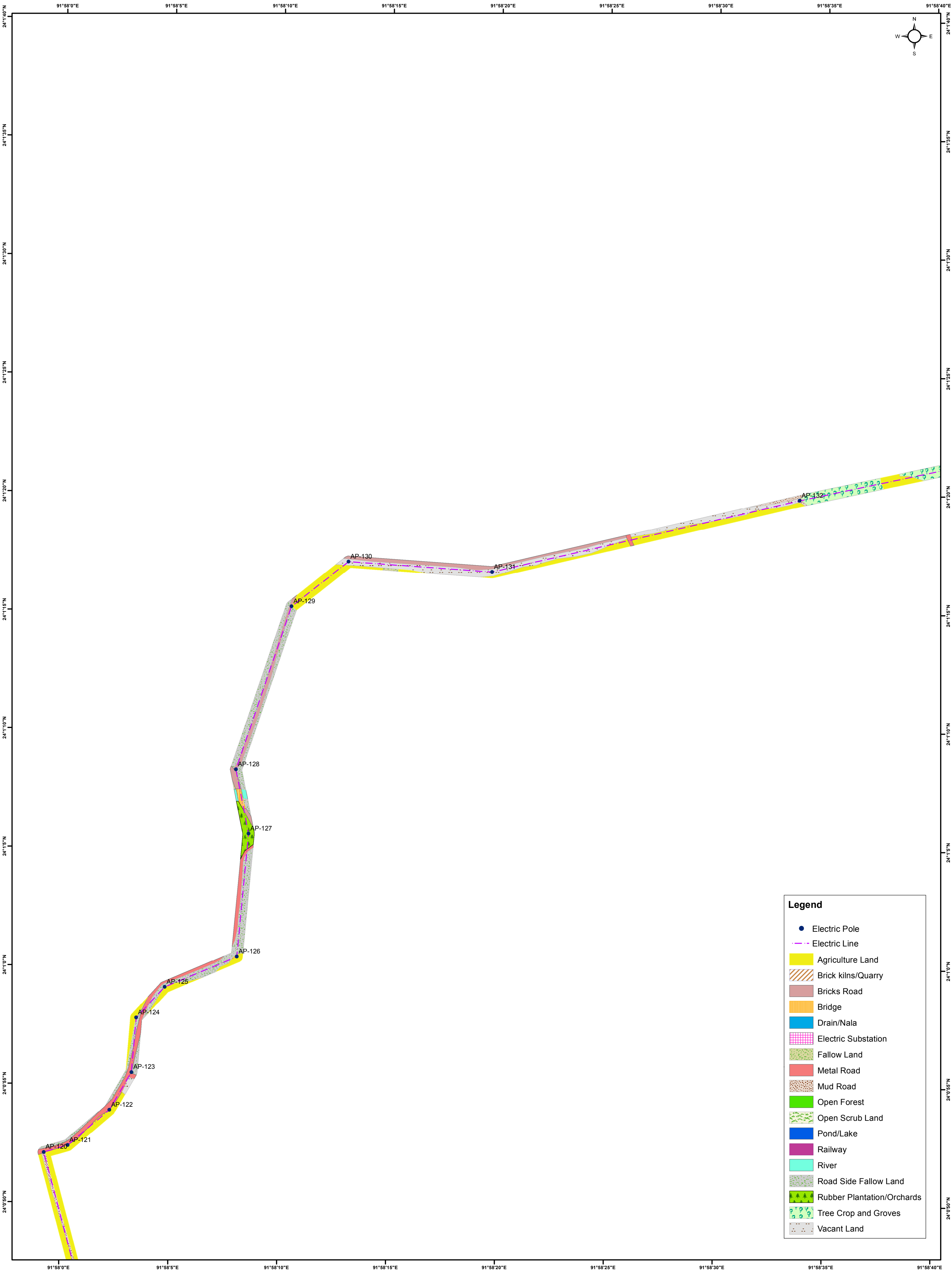
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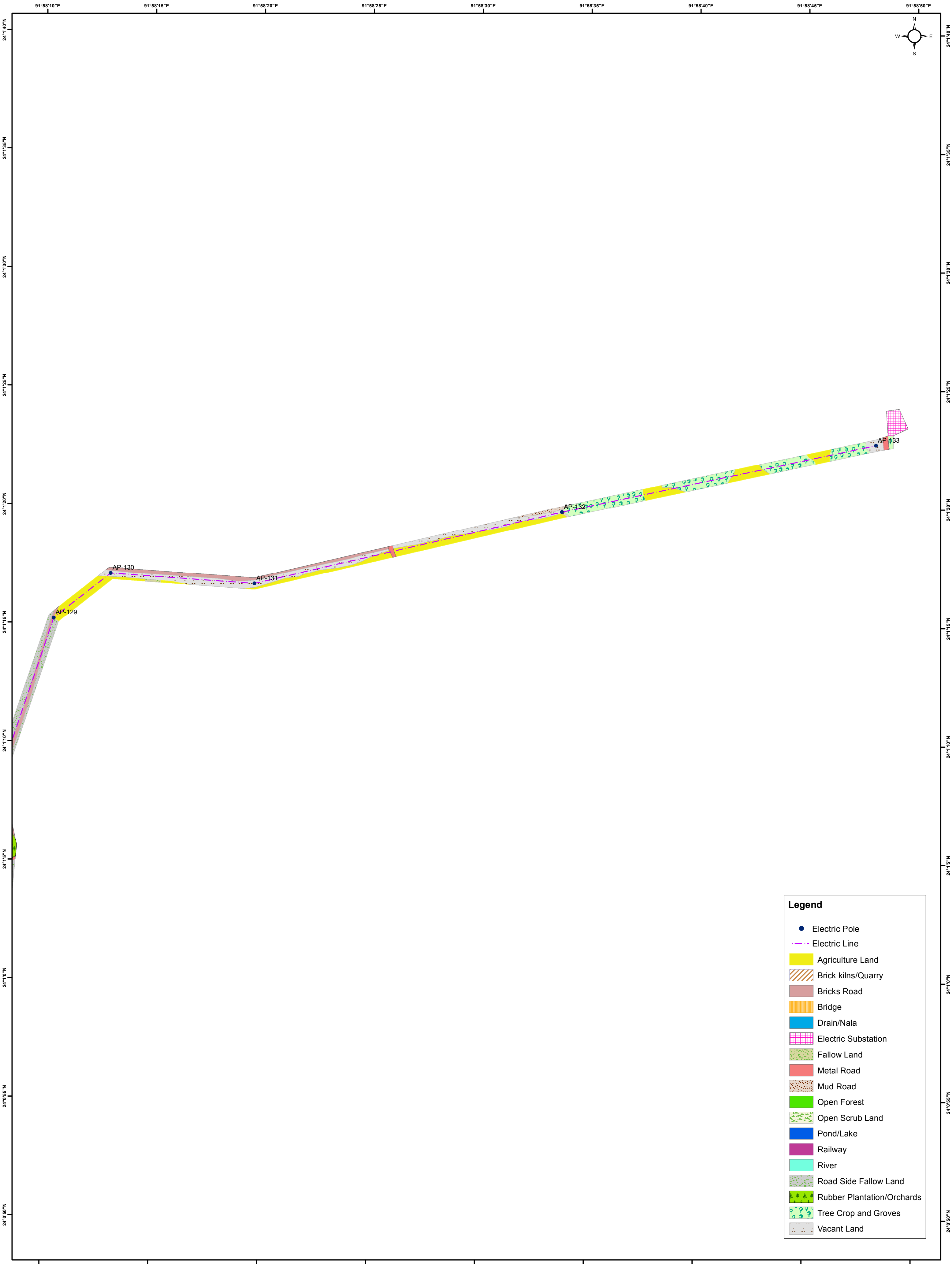
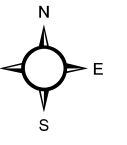
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