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Table 1: Environmental & Social Management Plan (ESMP)

S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
PRE-CONSTRUCTION PHASE[1]								
	A. Physical Environment							
1.	Substation and line alignment location and design	Disturbance to the adjacent lands and the people due to cut and fill operations	Construction of retaining structures, peripheral drain, minimize cut and fill operations, etc. Substation designed to ensure noise will not be a nuisance.	Setbacks to houses and other structures	Setback distances to nearest houses – as per RoW norms 132 kV- 27 m 220 kV- 35 m 400 kV/DC 46 m 400 kV/SC- 52 m	Once during substation siting survey and detailed alignment survey and design	Surveyor (during route survey) Contractor (Detailed design and layout development) PMC (Review of Detailed Design) AEGCL -PMU (Approval of survey report, detailed design and design layout), AEGCL Field Officials & P&E Wing	Part to site selection, layout development and detailed design
2.	Interference with drainage patterns/landslide hazard/Irrigation channels	Temporary flooding, landslide hazards/loss of agricultural production	Appropriate siting of towers to avoid channel interference. Marking of landslide zones along the route. Provision of retaining walls at tower base to mitigate landslide effect due to excavation to be included in the project cost.	Site location and transmission line alignment selection	Consultation with local authorities and design engineers	Once during alignment survey and detailed design	Surveyor (during route survey) Contractor (Detailed design and layout development) PMC (Review of detailed design) AEGCL -PMU (Approval of survey report, detailed design and design layout) & AEGCL Field Officials	Detailed alignment survey and design
	B. Ambient Environment[2]							
3.	Substation location and design	Noise generation Exposure to noise causing nuisance to neighboring	Substation designed to ensure noise will not be a nuisance. AEGCL – PMU and PMC to review the detail design to	Ambient noise levels at the substation boundary and distance from nearby dwellings	The Noise Pollution (Regulation and Control) Rules, 2000 and IFC/WB EHS	Once during project planning and site finalization	Contractor (Detailed design and layout development) PMC (Review of detailed design) AEGCL -PMU (Approval of, detailed design and design layout) &	Part of detailed alignment survey and design.

[1] All clearance/permits will be obtained prior to construction commencement.
[2] A full set of ambient baselines will be collected prior to contractor mobilization and present in the first monitoring report as a benchmark for construction impacts monitoring.

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		properties	ensure substation noise level are designed as per required limits.		General Guidelines and Guidelines for Electric Power Transmission and Distribution, whichever is stringent		AEGCL Field Officials	
4.	Location of land for transmission towers	Impact to the existing environment	Tower locations to be fixed at suitable distance from water bodies, natural flow paths, important ecological habitats and residential areas.	Soil Erosion and Impact on land use pattern	Visual identification - Environmental, Health, and Safety IFC/WB EHS General Guidelines and Guidelines for Electric Power Transmission and Distribution ~~(IFC)~~	Once during project planning stage	Surveyor (during route survey) Contractor (Detailed design and layout development) PMC (Review of detailed design) AEGCL - PMU (Approval of survey report, detailed design and design layout) AEGCL Field Officials	Detailed design
5.	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	PCBs forbidden in substation transformers or other project facilities or equipment	Transformer design	Exclusion of PCB's in transformers (should be part of tender specifications)	Once	AEGCL – PMU, PMC, AEGCL Field Officials & P&E Wing	Tender document/specifications
			The equipment's and process should not use chlorofluorocarbons or halon. Their use (if any) in existing process should be phased out and disposed of in a manner consistent with the required statutory	Design stage of equipment's and process finalization	Part of tender specifications (Exclusion of CFC) Disposal/phase out of existing equipment's and process (IEC	Once during project design and tender specifications	Contractor (during procurement of equipment) AEGCL - PMU & PMC (during site inspections and approval for installation) & AEGCL Field Officials	Part of tender document and detailed project design

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			guidelines.		61619 or ASTM D4059)			
	C. Ecological Environment							
6.	Encroachment into precious ecological areas	Loss of precious ecological values/ damage to precious species	Avoid encroachment by careful site and alignment selection and reconnaissance before final sitting of facilities.	Presence of area of ecological sensitivity and Floral and faunal habitats to be identified	Enumeration of flora and fauna at site in discussion with local authorities, forest department, Wildlife authority etc.	Once during route survey	Surveyor (during route survey) Contractor (Detailed design and layout development) PMC (Review of detailed design) AEGCL - PMU (Approval of survey report, detailed design and design layout) & AEGCL Field Officials	Detailed survey and design
7.	Cutting of Trees	Loss of trees along the RoW, deforestation and loss to biodiversity	Use of flexible tower placement, conductor heightening to avoid cutting of trees. Avoid selection of route with higher intensity of vegetation or plantation Tree replantation budget allocated as per Forest Department's requirement	Trees loss, relevance of applicable clearances required from concerned authorities (forest department, revenue authorities)	Tree Enumeration, nearest ecological sensitive areas.	Consultation with local authorities (once) Statutory approval (clearance) from relevant authorities (once)	Surveyor/AEGCL - PMU/Revenue Circle/Forest Department/Contractor & AEGCL Field Officials	Detailed Design and Planning stage
	D. Social Environment							
8.	Transmission line design	Exposure to electro-magnetic interference	Transmission line design to comply with the limits of electromagnetic interference from overhead power lines as Given in IFC EHS guidelines for Electric Power Transmission.	Electromagnetic field strength for proposed line design	Line design compliance with relevant standards	once	Contractor (Detailed design and layout development) PMC Review of detailed design) AEGCL -PMU (Approval of detailed design and design layout) & P&E Wing	Part of detailed alignment survey and design
9.	Involuntary resettlement or land acquisition	Loss of lands and structures	Compensation for temporary/ permanent loss of productive land, Development of stakeholder	Public complaints/Grievance RAP	Consultation with relevant PAP's and authorities	Consultation with authorities – Once	Revenue Circle/AEGCL – PMU/EPC Contractor/PMC & AEGCL Field Officials	Pre-Construction/ Prior to initiating

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			engagement plan as part of ESIA	Implementation	~~IFC's Environmental and Social Performance Standards (PS) 5~~AIIB's ESS2			Construction (during construction phase)
10.	Encroachment into farmland	Loss of agricultural productivity	Avoid siting towers on farmland/orchards wherever possible. Compensation to be paid for any temporary or permanent loss of crops	Implementation of crop and tree compensation in discussion with Concerned Revenue circle.	Consultation with local authorities and design engineers	Consultation and design review - Once	Surveyor/Revenue Circle/AEGCL-PMU/Horticulture Department/EPC Contractor PMC & AEGCL Field Officials	Part of detailed alignment survey and design
11.	Interference with drainage patterns/ Irrigation channels/rivers	Flooding hazards/loss of agricultural production	Appropriate siting of towers to avoid channel interference/low laying areas	Tower location and line alignment selection (distance to nearest flood zone)	Consultation with local authorities and design engineers	once	Surveyor (during route survey) Contractor (Detailed design and layout development) PMC (Review of detailed design) AEGCL - PMU (Approval of survey report, detailed design and design layout) PMC & AEGCL Field Officials	Part of detailed alignment survey and design
12.	Cutting of Trees	Livelihood loss	Avoid cutting/trimming. Trees to be allowed to be growing up to a height within the RoW by maintaining adequate clearance between the top of tree and the conductor as per the regulations. Trees that can survive trimming to comply with statutory distance should be lopped and not felled Compensation to be paid for	Species-specific tree retention as approved by statutory authorities Disposal of cleared vegetation as approved by the statutory authorities Careful Tower location and	As per applicable direction/ provisions of forest department.	Once before stringing activity	AEGCL- PMU/Revenue department (assessment and evaluation) /Contractor (Marking of tress)/PMC PMC & AEGCL Field Officials	Construction phase before commissioning of line.

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			any temporary or permanent loss of productive fruit trees/non fruit trees and trimming/pruning of fruit bearing trees along RoW	transmission line alignment selection and applicable Statutory approvals for tree trimming /removal from Horticulture department/Forest Department				
CONSTRUCTION PHASE								
	A. Physical Environment							
13.	Site clearance	Soil erosion and surface runoff	Construction near seasonal rivers, erosion and flood-prone areas should be restricted to the non-rainy season. Provision and maintenance of drains and retention ponds.	Soil erosion	Visual inspection (Turbidity and sedimentation) ~~IFC Performance Standard 6~~	Twice during construction phase	Contractor through contract provisions under supervision of PMC / PMU of AEGCL PMC & AEGCL Field Officials	Throughout the construction Phase
14.	OPGW Installation	Soil erosion and surface runoff	Construction near seasonal rivers, erosion and flood-prone areas should be restricted to the non-rainy season.	Soil erosion	Visual inspection (Turbidity and sedimentation)	Twice during construction phase	Contractor through contract provisions under supervision of PMC and PMU of AEGCL & AEGCL Field Officials	Throughout the construction Phase
15.	Disturbance to public utility services-Water supply, sanitation	Public inconvenience	Advance notice to the public about the time and the duration of the utility disruption. Use of well trained and experienced machinery operators to reduce	Disruption to other commercial and public activities/public complaints Contractor obligation to	Technical specification – per public complaint	At least Once during construction (as and when required)	AEGCL and Contractor through contract provisions and PMC through public disclosure and consultations & AEGCL Field Officials	Contractor provisions in planning stage and PMC monitoring in Construction period

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			accidental damage to the public utilities – pipelines/Power Lines/Road crossings etc. Restoring the utilities immediately to overcome public inconvenience.	restore the facilities such as blocked drains (if any) through contract provisions				
16.	Uncontrolled erosion/silt runoff	Soil loss, downstream siltation;	Minimize the need for access tracks, Use of existing roads.	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	Contractor through contract provisions under supervision of PMC and AEGCL -PMU & AEGCL Field Officials	Throughout the construction Phase
B. Ambient Environment								
17.	Equipment layout and installation	Noise and vibrations	Selection of construction techniques and machinery to minimise ground disturbance.	Construction techniques and machinery	Minimal ground disturbance	Once – Commencement of construction phase	Contractor through contract provisions under supervision of PMC and AEGCL -PMU & AEGCL Field Officials	Throughout the construction Phase
18.	Surplus earthwork/soil	Runoff to cause water pollution, solid waste disposal	Excess fill from tower foundation excavation to be reused on site where earth filling is required.	Location and amount (m3) of fill disposal Soil disposal locations and volume (m3)	Appropriate recoding disposal and dispersal locations in quarterly reporting of contractor and PMC	At least Once during construction phase (as and when required)	Contractor through contract provisions under supervision of PMC and AEGCL -PMU & AEGCL Field Officials	Throughout the construction Phase

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
19.	Substation construction	Loss of topsoil	Use the excess soil from excavation of the substation foundation and drainage improvement in filling operations	Borrow area sighting and required earth filling (area of site in m2 and estimated volume in m3)	Record maintenance for excavated earth and utilization of earth for earth filling	At Least once during construction phase (as and when required)	Contractor under supervision of PMC & AEGCL -PMU & AEGCL Field Officials	Throughout the construction Phase
		Water pollution due to wastewater disposal and construction water runoff. Interference in drainage of rain and wastewater at site	Construction of appropriate drain system Removal of silt and trash choking the drainage from the substation land.	Drains choked with rain/ water due to silt and trash	Presence of proper drainage and sanitation and waste disposal facilities	Daily - construction phase	Contractor under supervision of PMC & AEGCL -PMU & AEGCL Field Officials	Construction/ operation period Semi-annually Inspection report to be submitted by Contractor along with Photographs.
20.	Construction of roads for accessibility to substations	Air pollution due to loosen dust might blow in the area causing dusty conditions	Damping of dust by sprinkling of water within the work area and stack the loose soil and contain it with covers if required.	Soil stacking locations (access roads & substation site)	CPCB ambient air quality standards and IFC/WB EHS General Guidelines and Guidelines for Electric Power Transmission and Distribution, whichever is stringent	Daily - Visual inspections. Monitoring for PM_{10} & $PM_{2.5}$ twice	Contractor (for implementing mitigation measures), PMC (conducting air quality monitoring) under supervision of AEGCL – PMU & AEGCL Field Officials	Throughout the construction Phase
		Nuisance caused by noise to	Minimize construction activities undertaken during the night	Timing of construction (noise emissions,	Monitoring of time schedule for work	Weekly monitoring by contractor	Contractor (maintenance of record) and PMC (verification of record)	Throughout the construction

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
		neighboring areas	Construction as per scheduled timings only	[dB(a)])	~~&~~ CPCB regulations for noise level and IFC/WB EHS General Guidelines and Guidelines for Electric Power Transmission and Distribution, whichever is stringent	specially during usage of heavy machinery. PMC to monitoring noise levels in dB at least once during construction phase	under supervision of AEGCL – PMU & AEGCL Field Officials	Phase
21.	Construction of transmission towers	Loss of soil	Cutting and filling for the tower foundations obtained by creating or improving local drainage system.	Borrow area siting (area of site in m2 and estimated volume in m3)	As specified under EIA notification 2006 and amendments	Once – before commencing operation relating to borrow earth requirement (sand/ordinary earth)	Statutory clearance (Environmental Clearance) obtained for digging borrow earth to be obtained by **contractor** Contractor through contract provisions under supervision of PMC (verification of EC document) and AEGCL - PMU & AEGCL Field Officials	Throughout the construction Phase
		Water pollution	Minimize construction activities involving significant ground disturbance during the monsoon season. Provide drains and retention ponds if required.	Water Quality (pH, BOD/COD, suspended solids, other) during major earthworks	Water quality standards (WHO standards for drinking water. BIS drinking water standards IS:10500-2012. Effluent	At least once (as and when required)	Contractor (implementing mitigation measures) through contract provisions under supervision of PMC (monitoring of water quality parameters) and AEGCL – PMU (authorization of documents) & AEGCL Field	Throughout the construction Phase

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
					standards as per Environment (Protection) Amendment Rules, 2017		Officials	
22.	Provision of facilities for construction workers	Contamination of receptors (land, water, air) Heath Impact on labour due to lack of basic amenities	Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities. (IFC/EBRD- Worker's Accommodations: processes and standards or its equivalent can be followed)	Amenities for Workforce, grievances filed by workers.	Presence of proper sanitation, water supply and waste disposal facilities Statutory clearances obtained under: Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 and Contract Labour (Regulation and Abolition) Act, 1970 ~~IFC's Performance Standard 2~~AIIB ESS1	Once before commencing construction work	Contractor (to provide amenities to workforce) through contract provisions under supervision of PMC (visual inspection and monitoring for provided facilities to labour/workers) and AEGCL – PMU (validation of documentary evidence) & AEGCL Field Officials	Throughout the construction Phase
23.	Mechanized construction	Noise, vibration and operator	Construction equipment to be well maintained. Construction techniques and	Construction techniques and equipment -	Technical specifications, safety	Once a month	Contractor (implementation of proposed measures)	Throughout the construction

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
		safety, efficient operation Noise, vibration, equipment wears and tear	Machinery selection to minimize ground disturbance	estimated noise emissions and operating schedules	regulations, Noise control regulations (the more stringent of the standards, national or International to be followed)		through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	Phase
24.	Construction of roads for accessibility to transmission tower sites	Increase in airborne dust particles Increased land requirement for temporary accessibility	Existing roads and tracks to be used for construction and maintenance for access to the site wherever possible. New access ways to be restricted to a minimum of single carriageway width. Sprinkling of water to settle down dust particles.	Access roads, routes (length and width of access roads)	Use of established roads wherever possible Access restricted to a minimum of single carriageway width	Once a month	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	Throughout the construction Phase
25.	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 with reference to IFC/WB EHS General Guidelines and Guidelines for Electric Power Transmission and Distribution, whichever is stringent~~IFC's Performance~~	Once a month	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	Throughout the construction Phase

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
					~~Standard 3~~			
C	**Ecological Environment**							
26.	Site clearance	Vegetation	Marking of vegetation to be completed 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	Once a month	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	Throughout the construction Phase
27.	Trimming/cutting of trees within RoW	Loss of vegetation and deforestation	Trees that can survive cutting should be pruned. Felled trees and other cleared or pruned vegetation to be disposed of by authorized agents/forest department. Tree replantation budget allocated as per Forest Department's requirement	Species-specific tree retention as approved by statutory authorities (average and maximum tree height at maturity, in meters) Disposal of cleared vegetation as approved by the statutory authorities (area cleared in m2)	Presence of target species in RoW following vegetation clearance	On-going activity before Stringing of conductors	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	Throughout the construction Phase
28.	Tower Construction and stringing	Disturbance to animal movement and avian species	Consult the wildlife department Increase the tower height wherever close to the elephant corridors to maintain the required	Hight of tower Number of Diverter	As recommended by wildlife department	Once	AEGCL – PIU and PMC, Contractor (implementation of proposed measures) through contract provisions under supervision of wildlife department &	Throughout the construction Phase

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			ground clearance for crossing of wildlife Maintenance of sag line to 9 m height, barbed wire around towers in area with population of elephants. Deflectors and line markers need to be installed at the identified location of the transmission line – which is falling 10 km in the vicinity of Important Bird Areas/potential Migratory Bird route				AEGCL Field Officials	
29.	Wood/ vegetation harvesting, cut and fill operations	Loss of vegetation and deforestation	Construction workers should be prohibited from harvesting wood in the project area during their employment.	Illegal wood/vegetation harvesting (area in sq m, number of incidents reported)	Complaints by local people or other evidence of illegal harvesting	Once a month	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	Throughout the construction Phase
		Effect on fauna (including avifauna)	Preventing work force from disturbing the flora, fauna including hunting of animals and fishing in water bodies. Proper awareness programme regarding conservation of flora, fauna including ground vegetation to all workers.	Habitat loss	Complaints by local people or other evidence of illegal hunting	Once a month	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	Throughout the construction Phase

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			Construction is to be halted if breeding season is observed for any species.					
D	**Social Environment**							
30.	Construction schedules	Noise nuisance to neighbouring properties	Minimize construction activities should be undertaken during the night and local communities to be informed of the construction schedule.	Timing of construction (noise emissions, dBA)	Construction as per Scheduled timings only/consultation with nearby dwellings	Once	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	Throughout the construction Phase
31.	Acquisition of cultivable lands	Loss of agricultural productivity	Avoiding faming/harvesting season for field crops wherever possible for the project activities. Ensuring existing irrigation facilities to be maintained in working condition Protecting /preserving topsoil and reinstate after construction is completed Repairing /reinstating damaged bunds etc. after construction completion and Providing Compensation for temporary loss in agricultural production	Land area of agriculture loss Usage of existing utilities Status of facilities (earthwork in m3) Implementation of crop compensation (amount paid, dates, etc.)	Loss of crops-work in post-harvest period but before next crop Documentary evidence as certified by revenue officer	Once	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	Throughout the construction Phase
32.	Temporary use of land	Losses to neighbouring land uses/ values	Contract clauses specifying careful construction practices. As much as possible existing access ways to be used.	Contract clauses Design basis and layout. Reinstatement of land status (area	Incorporating good construction management, design	Twice (during tower erection and stringing activity)	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC	Throughout the construction Phase

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			Productive land to be reinstated following completion of construction Compensation to be paid for loss of production, if any.	affected, m2). Implementation of Tree/Crop compensation (amount paid).	engineering practices. Consultation with affected parties immediately after completion of construction and after the first harvest		(Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	
33.	Transportation and storage of materials	Nuisance to the general public	Transport loading and unloading of construction materials should not cause nuisance to the people by way of noise, vibration and dust Avoiding storage of construction materials beside the road, around water bodies, residential or public sensitive locations Construction materials should be stored in covered areas to ensure protection from dust, emissions and such materials should be bundled in environment friendly and nuisance free manner	Compliance to traffic management plan	CPCB Emission standards and Water Quality standards (the more stringent of the national or International standards to be followed)	Once a month	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	Throughout the construction Phase
		Road Safety	Prepare the Traffic Management Plan; Instruct drivers of construction vehicles to strictly follow road	Compliance to traffic management plan	Regular Monitoring and Daily Incident Reporting	Once a month	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC	Throughout the construction Phase

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			regulations; Adequate and clearly visible warning signs (such as danger, detour, cross here, works in progress, people at work, etc.) will be posted at designated sites while scaffoldings will be placed over road crossing points				(Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	
34.	Surplus Earth Work	Impact on community health and safety due to air pollution and increase in noise level	Selection of construction techniques and machinery to minimize ground disturbance, noise generation. Using water sprinkling to supress the dust	Construction techniques and machinery	Construction timing, type of machineries & pollution under control certificates of machineries in use.	Daily – during construction phase	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	Throughout the construction Phase
35.	Temporary outage of the electricity	Loss of power supply to the local community when distribution lines crossing the new transmission line are switched off	Advance notice to the public about the time and the duration of the utility disruption Restore the utilities immediately to overcome public inconvenience	Disruption of power supply to houses and commercial premises.	Regular monitoring during the period of construction - At each public complaint.	Continuous activity	AEGCL – Field staff and division officials	Throughout the construction Phase
36.	Worker's Health and safety Community health and	Injury and sickness of workers and members of the public; Incidents/ac	Contract provisions specifying minimum requirements for construction camps. Contractor to prepare and implement a health and	Contract clauses (number of incidents and total lost-work days caused by injuries and	Monitoring of Health and safety practices. IFC/WB EHS General Guidelines and	Workers Compensation Insurance to be valid throughout the project.	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and	Throughout the construction Phase

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
	safety	cidents; GBV/SE	safety plan and provide workers with required PPE. Contractor to arrange for health and safety awareness programmes including on AIDS and sexually transmitted diseases (STD). Detailed workers camp management plan.	sickness) Valid Workers compensation insurance policies and periodic heath check-up details	Guidelines for Electric Power Transmission and Distribution, whichever is stringent~~As per IFC's Performance Standard 2 & Performance Standard 4~~	Twice - Heath check-up of works	AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	
		Electrocution, other accidents, potential conflict between migrant workers and local inhabitants.	Adequate signage and barriers around charged components, conflict to be addressed through workshops to workers regarding local customs, and codes of conduct.	Complaints by public or workers. Record of accidents, at which stretch and the frequency.	Regular Monitoring and Daily Incident Reporting	Continuous activity	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence)	Throughout the construction phase
		Animal-human conflicts	Restrict construction work during the known period of crossing the route by any wildlife in the area	Identification of elephant corridor or wildlife corridor, identification of timing for crossing the path	Detailed Route Survey and daily monitoring during construction phase (National Forest Policy)	Entire construction phase	Contractor (implementation of measures), Forest officials, PMC and AEGCL -PMU	Throughout the construction Phase
37.	Impact on Migrant workers	Lack of proper contract, unregulated working hours,	The provisions given in the Inter-state Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979, along with the Bonded Labor	As per provisions Regulation of Employment and Conditions of Service) Act, 1979, along with the	Regulatory clearance documents	Continuous activity	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and	Throughout the construction phase

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
		unsanitary living conditions, occupational hazards, spread of diseases in camps; Potential conflict between migrant workforce and local inhabitants.	System (Abolition) Act 1976, and subsequent amendments, to be followed. Potential conflict to be addressed through proper awareness and training session to the workforce, to sensitise the workforce	Bonded Labor System (Abolition) Act 1976			AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	
38.	Capacity Building	Improve standards of implementation and monitoring	Training of AEGCL staff & Contractors	Training schedules	Number of training program	At least Once	PMC to provide training to EPC and AEGCL – PMU, AEGCL – Field staff and Divisional Officers.	Throughout the construction Phase
39.	Site clearance and excavation works	Chances of finding archaeological/cultural artefacts	Chance finds procedure Instruction to workers to not remove such articles and immediately information to Contractors supervisor and further to Environmental Specialist PMU	Discovery of any artefact of such historical or cultural significance	Chance finds procedure	As per occurrence of event	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and AEGCL – PMU (Validation of documentary evidence) & AEGCL Field Officials	Throughout the construction Phase
OPERATION AND MAINTENANCE PHASE								
	A. Ambient Environmental							
40.	Soil Erosion at tower base of transmission	Removal of topsoil	Planting of buffer zone native species suitable for terrain	Turbidity of water (Visual Inspection)	Visual inspection (Turbidity and sedimentation)	Continuous activity	AEGCL-Divisional Offices/PIU & PMC	Throughout the operations

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
	line							
41.	Oil Spillage	Contamination of land and nearby water bodies/aquifer	Presence of Oil pit for collection of oil leakage (if any from transformer) Storage of transformer oil drums on raised and solid surface.	Design of transformer pad and availability of storage area for transformer oil drums	Visual inspections	Continuous activity	AEGCL-Divisional Offices/PIU & PMC	Throughout the operations
42.	Switchgear operation	SF6 leakage during Operations and refilling activity	Record of all substation switchgear, storage cylinders located within secure casings	Usage of SF6 gas	As per prevailing guidelines	During storage and refilling of equipment's containing SF6 (Record is to be maintained for all substation switchgear, storage cylinders located within secure casings)	AEGCL-Divisional Offices/PIU & PMC	Throughout the operations
43.	Vegetation Clearance in substations	Soil and water contamination	Marking of vegetation to be removed prior to clearance, and strict control on clearing activities to ensure manual cutting and removal of vegetation	Vegetation marking and clearance control (area in $m^{2)}$ Usage of herbicides if any should be reported.	Visual Inspections to check if clearance is strictly limited to marked area	Weekly inspections	AEGCL-Divisional Offices/AEGCL – PIU & PMC	Throughout the operations
B. Ecological Environment								
44.	Vegetation Clearance in substation	Toxic impact on nontarget organism	Marking of vegetation to be removed prior to clearance, and strict control on clearing activities to ensure manual cutting and removal of vegetation	Vegetation marking and clearance control (area in $m^{2)}$ Usage of herbicides if any	Visual Inspections to check if cclearance is strictly limited to marked area	Weekly inspections	AEGCL-Divisional Offices/AEGCL -PIU & PMC	Throughout the operations

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
				should be reported.				
45.	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. Regular pruning is required.	Species-specific tree retention as approved by statutory authorities (average and maximum tree height at maturity, in meters.	Presence of target species in RoW following vegetation clearance	Continuous activity	AEGCL (Divisional Office and PIU), with forest department & PMC	Throughout the operations
46.	Stringing of line and post stringing	Disturbance to avifauna species due to collision with transmission line, electrocution to elephant and avifauna.	Deflectors and line markers need to be installed at the identified location of the transmission line – which is falling 10 km in the vicinity of Wildlife sanctuary/potential Migratory Bird route. Maintenance of sag line to 9 m height, barbed wire around towers in area with population of elephants. Monitoring of transmission line especially for bird strikes during the operation and use of deflectors if required. If the monitoring shows that certain areas of the transmission line show increased bird carcasses, additional bird flappers	Bird deaths and collisions	No. of bird deaths, frequency and seasons/times for these occurrences.	Once – Installation of deflectors/bird flappers	AEGCL-Divisional Offices/AEGCL – PIU & PMC	Throughout operations

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			might have to be installed. A routine for record keeping of bird carcass with details around numbers, species, and season is to be maintained by AEGCL and regularly analysed to determine the need for any enhanced mitigation measure.					
C	**Social Environment**							
47.	Operation and Maintenance of substations	Nuisance to Neighbouring properties	If required, provision of noise barriers near substation sites	Noise level	Noise level standards as prescribed by CPCB and IFC/WB EHS General Guidelines and Guidelines for Electric Power Transmission and Distribution, whichever is stringent	Once a year	AEGCL-Divisional Offices/AEGCL -PIU & PMC	Throughout the operation
48.	Operation and Maintenance of Transmission line	Exposure to electromagnetic interference	Transmission line to be designed to comply with the limits of electromagnetic interference from overhead power lines	Required ground clearance (meters).	Ground clearance, ~~standards~~ ICNIRP guidelines on EMF	Once	AEGCL-Divisional Offices/AEGCL -PIU & PMC	Throughout the operations
		Electric Shock Hazards	Careful design using appropriate technologies to minimize hazards	Usage of appropriate technologies	Preparedness level for using these	once a month	AEGCL-Divisional Offices/AEGCL -PIU& PMC	Throughout the operations

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
				(number of injury incidents, lost workdays)	technologies in crisis			
		lightning	Lightening conductor and earth wire will be installed on the transmission line. Resistance of turbine tower feet will be designed to limit lightning back voltage. Metallic components on structures located within the right of way will be grounded, where directly under transmission line. If there are structures with more than about 500m² of metal surface, provision for reconstruction in alternative materials. If there are structures used to store highly flammable materials, alternative storage arrangements will need to be provided.	Usage of appropriate technologies (number of incidents)	Preparedness level for using these technologies in crisis	once a month	AEGCL-Divisional Offices/AEGCL -PIU & PMC	Throughout the operations
49.	Inadequate provision of staff/workers health and safety	Injury and sickness of staff and workers	Availability of Personal Protective Equipment's. Safety awareness trainings. Availability of emergency action plan and training of staff and worker on implementation of emergency action plan	Availability of PPE's Training records Availability of emergency action plan Documentation of fire drills and emergency action plan implementation drills	Record of Number of staff trained in a year	Twice a year	AEGCL – corporate office/HR Department	Throughout the operations

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S. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards/ Measurement	Frequency	Institutional Responsibility	Implementation Schedule
50.	Training for Electric safety	Raising awareness for electrical safety measures	Training of AEGCL – Project Implementation Unit	Training schedules	Number of training program	Twice a year	AEGCL – corporate office/HR Department	Throughout the operations

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For effective monitoring of ESMP implementation, the collection of real time environmental data and assessment of same is of real importance. In order to certain the implementation of ESMP, Environmental and Social Monitoring Plan (ESMoP) is developed which is to be followed by the project management consultancy during pre-construction, construction and operational stage. The detailed ESMoP is provided Table 36 below:

Table 2: Environmental and Social Monitoring Plan

Environmental component	Project stage	Parameters to be monitored	Location	Frequency[3]	Standards	Implementation	Supervision
1.Air Quality	A. Pre-construction stage	PM_{10}, $PM_{2.5}$, along with Meteorological data-temperature Humidity, wind speed, wind direction	Inside the substation Boundary	One time	National Air quality standards of CPCB	PMC by CPCB approved laboratory	AEGCL-PMU/ AEGCL Field officials & PMC
	B. Construction Stage	PM_{10}, $PM_{2.5}$, along with Meteorological data-temperature Humidity, wind speed, wind direction	Same location as selected during pre-construction period	twice a year	National Air quality standards of CPCB	PMC by CPCB approved laboratory	AEGCL-PMU/ AEGCL Field officials & PMC
	C. Operation Stage	PM_{10}, $PM_{2.5}$, along with Meteorological data-temperature Humidity, wind speed, wind direction	Same location as selected during pre-construction period	One time	National Air quality standards of CPCB	PMC by CPCB approved laboratory	AEGCL-PMU/ AEGCL Field officials & PMC
2.Water Quality	A. Pre-construction stage	As per IS: 10500 (PH, Colour, TSS, Conductivity, Odour, Nitrate, Fluoride, Sulphates, Chloride, DO, BOD, T. coliform, E. coliform, Dissolved Iron, total pesticides, Floating materials- wood, plastic, rubber etc. Oil and grease, TDS, Turbidity Total hardness, (as $CaCO_3$), corrosivity, Taste)	Nearest downstream spring/handpump along the Project site	One time	National water quality standards of CPCB	PMC by CPCB approved laboratory	AEGCL-PMU/ AEGCL Field officials & PMC
	B. Construction	As per IS: 10500 (PH, Colour, TSS, Conductivity, Odour,	Nearest downstream spring/handpump	Twice a year	National water quality standards of	PMC by CPCB approved laboratory	AEGCL-PMU/

[3] Here the frequency means the frequency for the monitoring report. The ground data collection frequency should refer to those in the ESMP.

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Environmental component	Project stage	Parameters to be monitored	Location	Frequency[3]	Standards	Implementation	Supervision
	Stage	Nitrate, Fluoride, Sulphates, Chloride, DO, BOD, T. coliform, E. coliform, Dissolved Iron, total pesticides, Floating materials- wood, plastic, rubber etc. Oil and grease, TDS, Turbidity Total hardness, (as CaCO3), corrosivity, Taste)	along the Project site		CPCB		AEGCL Field officials & PMC
	C. Operation Stage	As per IS: 10500 (PH, Colour, TSS, Conductivity, Odour, Nitrate, Fluoride, Sulphates, Chloride, DO, BOD, T. coliform, E. coliform, Dissolved Iron, total pesticides, Floating materials- wood, plastic, rubber etc. Oil and grease, TDS, Turbidity Total hardness, (as CaCO3), corrosivity, Taste)	Nearest downstream spring/handpump along the Project site	One Time	National water quality standards of CPCB	PMC by CPCB approved laboratory	AEGCL-PMU/ AEGCL Field officials & PMC
3.Noise/ Vibration	A. Pre-construction stage	Noise level (dB level) On hourly basis for 24 hours	Inside the substation Boundary	One Time	CPCB standards for Noise and vibrations	PMC by CPCB approved laboratory	AEGCL-PMU/ AEGCL Field officials & PMC
	B. Construction Stage	Noise level (dB level) On hourly basis for 24 hours	Same location as selected during pre-construction period	Twice a year	CPCB standards for Noise and vibrations	PMC by CPCB approved laboratory	AEGCL-PMU/ AEGCL Field officials & PMC
	C. Operation Stage	Noise level (dB level) On hourly basis for 24 hours	Same location as selected during pre-construction period	One Time	CPCB standards for Noise and vibrations	PMC by CPCB approved laboratory	AEGCL-PMU/ AEGCL Field officials &

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Environmental component	Project stage	Parameters to be monitored	Location	Frequency[3]	Standards	Implementation	Supervision
							PMC
4. Soil	A. Pre-construction stage	PH, Sulphate (SO_3), Chloride, ORP, water Soluble salts EC, Organic Matter, Moisture Content	Inside the substation Boundary	One time	Technical specifications	PMC by CPCB approved laboratory	AEGCL-PMU/ AEGCL Field officials & PMC
	B. Construction stage	PH, Sulphate (SO_3), Chloride, ORP, water Soluble salts EC, Organic Matter, Moisture Content	Same location as selected during pre-construction period	Twice a year	Technical specifications	PMC by CPCB approved laboratory	AEGCL-PMU/ AEGCL Field officials & PMC
	C. Operation Stage	PH, Sulphate (SO_3), Chloride, ORP, water Soluble salts EC, Organic Matter, Moisture Content	Same location as selected during pre-construction period	One Time	Technical specifications	PMC by CPCB approved laboratory	AEGCL-PMU/ AEGCL Field officials & PMC
5. EMF	A. Pre-construction stage	Design specification	-	Once during final design approval	National Electrical Safety Code, American National Standard Institute, C2	Contractor (designing), PMC and PMU (design review)	AEGCL-PMU/ AEGCL Field officials & PMC
	B. Construction stage	Adherence to Design specification during construction work	Transmission line routes	Continuous activity	National Electrical Safety Code, American National Standard Institute, C2	Contractor	AEGCL-PMU/ AEGCL Field officials & PMC
	C. Operation Stage	Maintenance of conductor to ground, phase to phase and circuit to circuit clearances	Transmission line routes	Continuous activity	National Electrical Safety Code, American National Standard Institute, C2	AEGCL – Field Staff	AEGCL-PMU/ AEGCL Field officials & PMC
6. Carcass	A. Pre-construction stage	Visual inspection for substation locations and RoW of Transmission Line during detailed route survey	Substations & Transmission line routes	Continuous activity	Identification of carcass (animals/birds) to be reported to concerned forest/wildlife	Surveyor	AEGCL-PMU/ AEGCL Field officials & PMC
	B.	Visual Inspection for	Substations &	Continuous		Contractor	AEGCL-

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Environmental component	Project stage	Parameters to be monitored	Location	Frequency[3]	Standards	Implementation	Supervision
	Construction stage	substation and transmission line route during construction activity	Transmission line routes	activity	authority for identification of species. Record to be maintained for number of carcasses		PMU/ AEGCL Field officials & PMC
	C. Operation Stage	Visual Inspection for substation and transmission line route during maintenance activity	Substations & Transmission line routes	Continuous activity		AEGCL – Field Staff	AEGCL-PMU/ AEGCL Field officials & PMC
7. Traffic	A. Pre-construction stage	Number & type of vehicles being used to access path for conducting detailed route survey	Transmission Line Route	Continuous activity	Record maintenance for being used for survey and increased traffic load in localities	Surveyor	AEGCL-PMU/ AEGCL Field officials & PMC
	B. Construction stage	Number & type of vehicle being used for material transportation by EPC contractor.	Substations & Transmission line routes	Continuous activity	Maintenance of Logbook for in-out time of vehicle on site (substation and transmission line routes)	Contractor	AEGCL-PMU/ AEGCL Field officials & PMC
	C. Operation Stage	Number & Type of vehicles being used for maintenance activity	Substations & Transmission line routes	Continuous activity	Maintenance of Logbook for in-out time of vehicle on site (substation and transmission line routes)	AEGCL – O&M staff	AEGCL-PMU/ AEGCL Field officials & PMC
8. Tree cutting	A. Pre-construction stage	Enumeration of trees during detailed survey of transmission route and after finalization of layout plan of selected substation area	Substations & Transmission line routes	Once during detailed survey and layout design development	Documentary evidence to be maintained by surveyor for counting of trees	Surveyor	AEGCL-PMU/ AEGCL Field officials & PMC
	B. Construction stage	Development of inventory of tress before starting stringing for transmission lines and before initiating the substation construction	Substations & Transmission line routes	Once during construction phase	Marking of tress by revenue authority in presence of contractor and AEGCL officials Obtaining applicable	Contractor/Revenue Department/AEGCL	AEGCL-PMU/ AEGCL Field officials & PMC

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Environmental component	Project stage	Parameters to be monitored	Location	Frequency[3]	Standards	Implementation	Supervision
					clearance from forest department in case tree cutting is involved in declared forest area		
	C. Operation Stage	Pruning/cutting of tress for maintenance activity	Transmission line routes	Continuous activity	Maintenance of minimum clearance between conductors and trees. Obtaining applicable clearance from forest department in case tree cutting/pruning is involved in declared forest area	Contractor/Revenue Department/AEGCL	AEGCL-PMU/ AEGCL Field officials & PMC
9. Stakeholder Engagement	A. Pre-construction stage	Mapping of stakeholders	Substation and Transmission Line routes	Continuous activity	Consultation record with mapped stakeholders (minutes of consultation and attendance sheet)	DPR Consultant/ Concerned revenue circle	AEGCL-PMU/ AEGCL Field officials & PMC
	B. Construction stage	Listing of identified stakeholders (administrative and project affected people)	Substation and Transmission Line routes	Continuous activity	Consultation record with identified stakeholders (minutes of consultation and attendance sheet)	Contractor/PMC/AEGCL/ concerned revenue circle	AEGCL-PMU/ AEGCL Field officials & PMC
	C. Operation Stage	Identified stakeholders at project pre construction and construction stage	Substation and Transmission Line routes	Continuous activity	Consultation record with identified stakeholders (minutes of consultation and attendance sheet)	AEGCL – Field Officers	AEGCL-PMU/ AEGCL Field officials & PMC
10. Grievance Mechanism	A. Pre-construction stage	Identification of officials, NGO, stakeholders to be part Grievance redressal committee	All Project Locations	Continuous activity	Development of Grievance redressal mechanism as per provisions	AEGCL - PMU	AEGCL-PMU/ AEGCL Field officials &

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Environmental component	Project stage	Parameters to be monitored	Location	Frequency[3]	Standards	Implementation	Supervision
					Notification of formulation of GRM and GRC		PMC
	B. Construction stage	Working files of GRC and GRM records	All Project Locations	Continuous activity	Notification of formulation of GRM and GRC and display of GRM procedure in project locations. Working records for GRM	Contractor, PMC, AEGCL – PMU, Revenue department and concerned electrical circle, AEGCL – Field staff	AEGCL-PMU/ AEGCL Field officials & PMC
	C. Operation Stage	Working files of GRC and GRM records	All Project Locations	Continuous activity	Notification of formulation of GRM and GRC and display of GRM procedure in project locations. Working records for GRM	Concerned field staff, concerned electrical circle, concerned revenue department	AEGCL-PMU/ AEGCL Field officials & PMC
11. Compensation	A. Pre-construction stage	Identification of project affected people	All project locations	During detailed route survey and identification of land parcel	Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013 and IFC's Performance Standard 5	Revenue circle & AEGCL/ /EPC Contractor	AEGCL – PMU & Revenue Department/ PMC & AEGCL Field Officials
	B. Construction stage	Mapping and listing of projects affected people (crop damage (area m^2), zirat damage (marking of trees & development of inventory), land acquisition (area m^2) – if applicable	All project locations	Before commencement of work in area of impact		Contractor, PMC, Revenue circle & AEGCL/ /EPC Contractor	AEGCL – PMU & Revenue Department /PMC & AEGCL Field Officials
	C. Operation Stage	Marking of tress (enumeration) to where pruning/cutting is required to maintain clearance between trees and conductor. Damage	Transmission lines routes	Continuous activity		AEGCL – concerned electrical circle and AEGCL – field staff (O&M)/ /EPC Contractor	AEGCL – PMU & Revenue Department/ PMC &

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Environmental component	Project stage	Parameters to be monitored	Location	Frequency[3]	Standards	Implementation	Supervision
		to crop (area m² and listing of crop) during maintenance of line					AEGCL Field Officials
12. Livelihood	A. Pre-construction stage	Identification of any impact on livelihood due to acquisition of land, crop damage and zirat damage.	All project locations	Once during detailed route survey and identification of land parcel for substation	Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013 and IFC's Performance Standard 5	Revenue Department & AEGCL concerned divisional officer, PMC, EPC Contractor	AEGCL – PMU/ PMC & AEGCL Field Officials
	B. Construction stage	Identification of any impact on livelihood due to loss of land (area m²) – land utilization pattern, crop damage (area m² and type of crop) and zirat damage (inventory development)	All project locations	Once – before commencing construction work		Revenue Department & AEGCL concerned divisional officer, PMC, EPC Contractor	AEGCL – PMU/ PMC & AEGCL Field Officials
	C. Operation Stage	Identification of any impact on livelihood due to acquisition of land, crop damage and zirat damage (inventory development)	All project locations	Continuous activity		Revenue Department & AEGCL concerned divisional officer, EPC Contractor	AEGCL – PMU/ PMC & AEGCL Field Officials
13. Restoration	A. Pre-construction stage	Identification of any damage to public utilities and public/private property to be envisaged during construction phase	All project locations	Once during detailed survey and identification of land parcel for substation location	Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013 and IFC's Performance Standard 5	Revenue Department & AEGCL concerned divisional officer, PMC, EPC Contractor	AEGCL – PMU/ PMC & AEGCL Field Officials
	B. Construction stage	Marking and listing of damage to public utilities/shifting of public utilities and public/private property	All project locations	Continuous activity		Revenue Department & AEGCL concerned divisional officer, PMC	AEGCL – PMU/ PMC & AEGCL Field Officials
	C. Operation	Marking and listing of	All project locations	Continuous		Revenue Department &	AEGCL –

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Environmental component	Project stage	Parameters to be monitored	Location	Frequency[3]	Standards	Implementation	Supervision
	Stage	damage to public utilities/shifting of public utilities and public/private property		activity		AEGCL concerned divisional officer	PMU/ PMC & AEGCL Field Officials

Abbreviations:
PMU – Project Management Unit
PMC – Project Management Consultancy
P&E Wing - Planning and Engineering Wing
SO2- -Sulphur Dioxide; NO2- - Nitrogen Dioxide; CO- Carbon Monoxide; EC – Electric Conductivity;
Pb – Lead; PM2.5 - Particulate Matter <2.5; PM10 - Particulate Matter <10; TSPM- Total suspended Particulate Matter;
EC - Electrical Conductivity; DO - Dissolved Oxygen; TSS - Total Suspended Solids;
BOD - Biological Oxygen Demand; NAAQS - National Ambient Air Quality Standards;
NWQS - National water Quality Standards; AEGCL - Assam Electricity Grid Corporation Limited;
ORP – Oxidation Reduction Potential, PMC – Project Management Consultancy
PMU – Project Management Unit (AEGCL), PIU – Project Implementation Unit (AEGCL)IFC – International Finance Corporation (World Bank Group), HR – Human Resource
PS – Performance Standards