Environmental Monitoring Report

Project Number: 45224-003
October 2016

Period: March 2015 – March 2016

IND: Rajasthan Renewable Energy Transmission Investment Program - Tranche 1

Subprojects: 400KV Pooling substation Ramgarh & augmentation works at Akal GSS (ICB 1); and 400KV Pooling substation Bhadla & augmentation works at Bikaner GSS (ICB 2)

Submitted by

Rajasthan Rajya Vidyut Prasaran Nigam Limited, Jaipur

Asian Development Bank

for signing pls NK/VRK.

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED
OFFICE OF THE Addl. CHIEF ENGINEER (Contracts)
Corporate Identity Number(CIN): U 40109RJ2000SGC016485
Regd.Office: MM Building of RVPN, Old Power House Premises (Back Side),Near Ram Mandir, Bani Park,Jaipur-302006

NO. RVPN /ACE (Contracts)/ SE (Contracts-I) / D. 91 Dated 15.9.16

Dear Mr. Karbar,
Energy Specialist
ADB

Please find enclosed herewith the Social & Environmental Safeguard reports for ICB 1, 2, 5 & 6 under Tranche-1 for the period up to March-16. These reports for the period of April-16 to September-16 will be submitted by the end of the October-16.

Regards

15/9/16

(V. K. Mishra)
Addl. Chief Engineer (Contracts)
RVPN, Jaipur

Copy to Mr. Len George for information please.

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1st Environment Monitoring Report
For ICB 1: 400 kV Pooling Substation Ramgarh& augmentation works at Akal GSS

Document Stage: Final Document
Project Number: 45224 (IND)
Period – March 2015 –March 2016.
Reporting – April -2016.

India: Rajasthan Renewable Energy Transmission Investment Program

Prepared for Asian Development Bank byRajasthan RajyaVidyutPrasaran Nigam Limited (RRVPNL), Government of Rajasthan.

Environment Monitoring Report

Compliance Status & Monitoring Report of Environment Safeguards

Period: March 2015 –March 2016
Submitted by: Rajasthan RajyaVidyutPrasaran Nigam Limited, Rajasthan

Table of Contents

Abbreviations

AP's	Affected Persons
C/o	Construction of
Deptt.	Department
Distt.	District
FCA	Forest Conservation Act
GIS	Gas Insulated Switchgear
GoI	Govt of India
GRC	Grievance Redressal Committee
Ha.	Hectare (10,000 sq. m. land)
IE Rule	Indian Electricity Rule
MOEFCC	Ministry of Forest, Environment and Climate Change
MPAF	Main Project Affected Family

Project Information

A.1. General

I	Name of Project	**Rajasthan Renewable Energy Transmission Investment Program**
II	Loan Number	Loan 3052-IND: Rajasthan Renewable Energy Transmission Investment Program - Tranche 1
II	Name of Monitoring/Reporting Agency and address	RRVPNL/VidutBhawan, Janpath, Jyoti Nagar Jaipur – 302005 Techno Electric and Engineering Co. Ltd., 47 Mission Compound, 1st Floor, Near Ajmer Pulia, Ajmer Road, Jaipur
III	Monitoring Period (Season/month)	March -2015 to March-2016
IV	Report No.	1
V	Report for the period	March -2015 to March -2016
VI	Date of reporting	9th September 2016

A.2. Subproject details

	List of sub-projects	**Name of the Project site**
I	ICB 1: 400 kV Pooling Substation Ramgarh& augmentation works at Akal GSS	ICB 1: 400 kV Pooling Substation Ramgarh& augmentation works at Akalunder specification No. RRVPN / ADB / Tranche 1/ICB-1 (Supply & Service contract) to M/s. Techno Electric and Engineering Co. Ltd.
II		Contract Agreement signed 27.02.2015
III		
IV		
V		
VI		

A.3. Overall Project Progress, Agreed Milestones and Implementation Schedules*

S No	Stage of sub-project	Progress as on date of Report	Implementation Schedule
1	Design	85%	90%
	Foundations	63%	69%
	Supply order	73.33%	75%
	Erection	22%	30%
	Testing Commissioning	NIL	NIL

- Above Report based on the Approved L2 Schedule. Progress Report Enclosed

B.1: Compliance Status with National/State/Local Statutory Environmental Requirements and international standards

S No	Legal Requirements/Acts/Rules/Guidelines	Applicable Attributes	RRVPNL's Compliance Status
1	The Water (Prevention and Control of Pollution) Act, 1974 as amended;	Water Pollution	Preventive measures are being adopted to avoid such pollution. Report shall be submitted by Sep'2016.
2	The Air (Prevention and Control of Pollution) Act, 1981	Air Pollution	Preventive measures are being adopted to avoid such pollution. Report shall be submitted by Sep'2016.
3	The Environment (Protection) Act, 1986	Construction Practices	Report shall be submitted by Sep'2016.
4	The Environment Impact Assessment Notification, 1994 as amended	EMP monitoring	Report shall be submitted by Sep'2016.
5	The Hazardous Wastes (Management and Handling) Rules, 1989 as amended	Transformer Oil	Report shall be submitted by Sep'2016.
6	The Ozone Depleting Substances (Regulation and Control) Rules, 2000	Cleaning of electrical contacts using HFCs etc.	Report shall be submitted by Sep'2016.
7	The Batteries (Management and Handling) Rules, 2001 as amended	Batteries	Report shall be submitted by Sep'2016.
8	The Indian Forest Act, 1927 as amended	Reserve Forest areas, Right of way	Forest Land is not involved in the substation.
9	The Wild Life (Protection) Act, 1972 as amended	Critical habitats	No Wild life is involved in Project.
10	The Biological Diversity Act, 2002	Wetland	No Wetland is involved.
11	The Forest (Conservation) Act, 1980 as amended	Construction work in forest areas	Forest Land is not involved.
12	The National Environmental Policy, 2006 of GoI	Construction Practices	GOI norms for environmental management followed for all construction work
13	Other State Level Acts	Compensation	Compensation as per RRVPNL and state Revenue department.
14	Other International levels conventions and treaties	Biodiversity, GHG emissions	Not being affected.

B.2: General Implementation Status

B.2.1. Forest Clearance.

SN o.	Measures/ stipulation	Compliance Status
1	**Sub-Project #**	
1	Right of Way/ land required	Government Land
2	Clearance from trees	No trees on the site
3	Forest area and Nos. of trees.	No Forest land is being involved.
4	Damage to forest	No forest in the vicinity.
5	Wild life sanctuaries	No Wild life is involved in Project.

B.2.2. Fulfillment of commitments made during Public Hearing/Consultation

S.No.	Query/Apprehension	Commitment	Compliance Statement
I	**Sub-project #**		
1	Compensation for crop	As per EPC contractor bid	None
2	Compensation for land damages	As per EPC contractor bid	No land is damaged during the construction of line.
3	Compensation for pathways,	Restoration after erection by	Till date no pathways, channels

	channels for waterway.	EPC contractor	for waterways have been affected during the work. If affected, they shall be restored properly.
4	Nuisance due to dust, noise, vibrations, labor during construction	As per EMP implemented by EPC contractor	Preventive actions are being adopted to avoid such nuisance. Measures to reduce dust, noise, vibrations and labor problems currently. Report shall be submitted by Sep'2016.

B.2.3. ADB Stipulations/ safeguarding measures on Environment.

SNo.	Product Activity/Stage	Parameter to be monitored	Compliance Status
I	**Sub-Project #**		
	Construction		
1	Archeological site/ monument safety	Chance find	Not involved
2	Public places, schools, ponds, airport, railway etc.	Distance 500 m away	No school, ponds in the area.
3	Safeguard against critically endangered Flora and fauna.	Avoid	No Flora Fauna involved in project
4	Rain and Flood prone area.	Avoid	Not a flood prone area
5	Environmental parameters for air, noise, land and water during project construction	Environmental Monitoring Plan	Report shall be submitted later in Sep'2016.

B.2.4 Record of complaints (regarding environment safeguard measures) and their resolution

Sr.No	Complainant Name and address	Date of receipt	Subject/Issue	Date of resolution	Remarks
I	**Sub-Project #**				
	As on date no complaint has been received				

B.2.5. Staffing, Institutional Arrangements and Grievance Redress

Sl.No.	Parameters	Commitment	Compliance Statement
1	Numbers of Staff deputed/employed for environment safeguards	One at -site	One Safety Officer
2	PIU established as per proposed institutional mechanism	Vide letter no.125220-8-2015dtd.	Start of date of construction is 21.08.15
3	GRC formation	It will be formed and intimated by Sept 2016.	Project Engineer, safety head, and RVPNL JEN
4	Grievance Redress Mechanism followed	Proper record	Currently no environment related grievance received.

B.2.6. Other measures:

I	Sub-Project #
1	
2	

B2.7 Annexures

I	Sub-Project #
1	Photographs of the following – foundation construction, stores, toilets, drinking water, kitchen, PPE etc.
2.	RVPNL Letter dated 19.02.2016 regarding EMP issues
3.	Baseline Report of Environmental Parameters (Pre-construction)

4.	Techno Engineering Reply to RVPNL Letter dated 19.02.2016 regarding EMP issues: Remedial measures take from Techno in response to Annexure 1 and 2 above.
5.	Approved L2 Schedule. Progress Report Enclosed

B.3: Status of Implementation of Environment Management Plan (EMP) and Environment Monitoring Plan (EMoP)

B3.1. Environment Management Plan and Status on Implementation

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
Pre-construction								
Temporary use of land	Impact to the existing environment	Selection of lands adhering to local laws and regulations Construction facilities should be placed at least 500 m away from water bodies, natural flow paths, important ecological habitats and residential areas	water and air quality	Village areas atleast 500 m away	NA			RRVPNL
Substation location and design	Noise generation Exposure to noise, Nuisance to neighbouring properties	Substation designed to ensure noise will not be a nuisance.	Expected noise emissions based on substation design, noise levels	Village areas atleast 500 m away	Digging of foundations mostly in soil and no rock is there	NIL		RRVPNL
	Disturbance to the adjacent lands and the people due to cut and fill operations	Maintained adequate clearance, construction of retaining structures, minimise cut and fill operations adjoining to the dwellings	Setbacks to houses and other structures					
Location of transmission towers and transmission line alignment and design	Exposure to safety related risks	Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites.	Tower location and line alignment selection with respect to nearest dwellings	House/dwelling area at least 500 Mtr away.	NA	NA	NA	RRVPNL
	Impact on water bodies / land/ residences	Consideration of site location to avoid water bodies or agricultural land as much as possible. Careful site selection to avoid existing settlements	Site location, line alignment selection (distance to dwelling, water and/or agricultural land)	All the water bodies/dwellings are more than 500 mtrs away from the substation land	NA	-	-	RRVPNL
Equipment specifications and design parameters	Release of chemicals and harmful gases in receptors (air,	PCBs free substation transformers or other project facilities or equipment.	Transformers and specifications and compliance with setback distances	Equipment Design for substation submitted to RRVPNL for review	Design approved			RRVPNL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
	water, land)		("as-built" diagrams)					
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 siting of activities. Minimise the RoW wherever possible	Floral and faunal habitats loss	No ecological areas are involved in substation.		-	-	RRVPNL
Involuntary resettlement or land acquisition	Loss of lands and structures	Compensation paid for temporary/ permanent loss of productive land	Public complaints		NA	NA	-	RRVPNL
Encroachment into farmland	Loss of agricultural productivity	Use existing tower footings/towers wherever possible Avoid siting new towers on farmland wherever possible Farmers compensated for any permanent loss of productive land and trees that need to be trimmed or removed along RoW.	Tower location and line alignment selection Design of implementation of crop and tree compensation (based on affected area) Statutory approvals for tree trimming /removal		NA	NA	NA	RRVPNL
Interference with drainage patterns/Irrigation channels	Temporary flooding hazards/loss of agricultural production	Appropriate sighting of towers to avoid channel interference Appropriate provision or excess soil dug up from the foundations/trenches	Site location and line alignment selection	Substation foundations are spotted beyond the boundaries of water channel.		278	-	RRVPNL
Explosions/Fire	Hazards to life	Design of substations to include modern fire control systems/firewalls. Provision of firefighting equipment to be located close to transformers,	Substation design compliance with fire prevention and control codes	Design of substation equipment approved by RRVPNL	Design approved			RRVPNL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
		power generation equipment.						
Construction								
Removal or disturbance to other public utilities	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 accidental damage to the public utilities Restore the utilities immediately to overcome public inconvenience	Disruption to other commercial and public activities / Public complaints	Advance notice will be published into the local newspaper for electric utility shutdown.			-	RRVPNL
Acquisition of cultivable lands	Loss of agricultural productivity	Avoid faming season wherever possible for the project activities. Ensure existing irrigation facilities are maintained in working condition Protect /preserve topsoil and reinstate after construction completed Repair /reinstate damaged bunds etc. after construction completed Compensation for temporary loss in agricultural production.	Land area of agriculture loss Usage of existing utilities Status of facilities (earthwork in m^3) Implementation of crop compensation (amount paid, dates, etc.)	No work locations in any farming area Top soil will be restored during the back filling work.	Completely	-	-	RRVPNL
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	Power disruption to houses and commercial premises of power disruption	Advance notice will be published into the local newspaper for electric utility shutdown.			-	RRVPNL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
Equipment layout and installation	Noise and vibrations	Selection of construction techniques and machinery to minimise ground disturbance.	Construction techniques and machinery	Construction activity carried out during in day.			-	RRVPNL
	SF6 leakage during storage and erection of Switchgear	Record of all substation switchgear, storage cylinders located within secure casings	Switchgear casings and substation bounding	No equipment supplied currently				
Substation construction	Loss of soil	Fill for the substation foundations obtained by creating or improving local drain system.	Borrow area sighting (area of site in m^2 and estimated volume in m^3)	Top soil retained inside substation				
	Interference in drainage of rain and waste water at site	Removal of silt and trash choking the drainage of the substation land	Drains choked with rain/water due to silt and trash	None				
	Water pollution	Construction activities involving significant ground disturbance (i.e. substation land forming) not undertaken during the monsoon season.	Water Quality (pH, BOD/COD, Suspended solids, other) during major earthworks	Testing to be done as per EMP requirement bySept 2016				
Construction schedules	Noise nuisance to neighbouring properties	Minimize construction activities undertaken during the night and local communities informed of the construction schedule.	Timing of construction (noise emissions, [dB(a)])	Villages located about 500 m away from substation and mostly work carried out during day time.	-	-		RRVPNL/Techno
Provision of facilities for construction workers	Nuisance to wildlife if the line construction crosses their migratory path	Restrict construction work during the known period of migration by any wildlife in the area	Timing of Construction	No wild life area involved	-	-	-	RRVPNL/Techno
	Contamination of receptors (land, water, air)	Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities.	Amenities for Workforce facilities	Covered and fence wall around the worker living area. Workers have sufficient waste water collection system and septic camp.	-	-		RRVPNL/Techno
Surplus earthwork/soil	Runoff to cause water pollution, solid waste disposal	Excess fill from tower foundation excavation to be reused on site or disposed of next to roads or around houses, in agreement with the local community or landowners.	Location and amount (m^3) of fill disposal Soil disposal locations and volume (m^3)	Excess soil is dumped inside the substation and then used for fill inside.	-	-		RRVPNL/Techno

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
Air Pollution	Loose 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, tower locations, substation site	Lack of water leading to no spraying of water to minimize dust releasing in case of windy and dry weather.		-	-	RRVPNL/Techno
Wood/ vegetation harvesting, cut and fill operations	Loss of vegetation and deforestation	Construction workers prohibited from harvesting wood in the project area during their employment.	Illegal wood /vegetation harvesting (area in m^2, number of incidents reported)	Firewood used, however LPG cylinder will be provided to Labor.		-	-	RRVPNL/Techno
	Effect on fauna	Prevent work force from disturbing the flora, fauna including hunting of animal and fishing in water bodies. Proper awareness programme regarding conservation of flora, fauna including ground vegetation to all drivers, operators and other workers.	Habitat loss	Training program to be conducted to create awareness among the workers and staff to conserve the flora and fauna.		-	-	RRVPNL/Techno
Site clearance	Vegetation	Marking of vegetation to be removed prior to clearance, and strict control on clearing activities to ensure minimal clearance.	Vegetation marking and clearance control (area in m^2)	Vegetation land not involved at the substation line		-	-	RRVPNL/Techno
	Soil erosion and surface runoff	Construction near seasonal rivers, erosion and flood-prone areas (if any) should be restricted to the dry season. Provision and maintenance of drains and retention ponds. Treat clearing and filling areas against flow acceleration and construction work should be carefully designed to	Soil erosion	No soil erosion involve during the construction activity of substation.		-	-	RRVPNL/Techno

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
		minimiseobstruction or destruction to natural drainage.						
Mechanised construction	Noise, vibration and operator safety, efficient operation Noise, vibration, equipment wear and tear	Construction equipment to be well maintained. Proper maintenance and turning off plant not in use.	Construction equipment - estimated noise emissions and operating schedules	Construction equipment is regularly maintained. Pollution under control certificate to be made available	Completely	-	-	RRVPNL/Techno
Construction of roads for accessibility	Increase in airborne dust particles Increased land requirement for temporary accessibility	Existing roads and tracks used for construction and maintenance access to the site wherever possible. New access ways restricted to a single carriageway width within the Row.	Access roads, routes (length and width of access roads)	Existing road/path only used for the construction activity. Any new access path used is only one carriageway width for tractor, JCB machine and other machines.		-	-	RRVPNL/Techno
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 Avoid storage of construction materials beside the road, around water bodies, residential or public sensitive locations Construction materials should be stored in covered areas to ensure protection from dust, emissions and such materials should be bundled in environment friendly and nuisance free manner	Water and Air Quality	Dropping material in the road collected. Construction material stored at high level ground level at construction site. Construction material – sand will be covered at top to avoid air pollution and stacked top soil to be also covered at top to avoid blowing during windy conditions		-	-	RRVPNL/Techno
Trimming/cutting of	Fire hazards	Trees allowed growing	Species-specific tree	NA	NA	-	-	

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
trees within RoW	Loss of vegetation and deforestation	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 Felled trees and other cleared or pruned vegetation to be disposed of as authorised by the statutory bodies.	retention as approved by statutory authorities (average and maximum tree height at maturity, in metres) Disposal of cleared vegetation as approved by the statutory authorities (area cleared in m^2)					
Health and safety ADD PPE	Injury and sickness of workers and members of the public	Contract provisions specifying minimum requirements for construction camps from water bodies, reserved areas etc. Contractor to prepare and implement a health and safety plan and provide workers with required personal protective equipment (PPE) at site. Contractor to arrange for health and safety awareness programmes	Contract clauses (number of incidents and total lost-work days caused by injuries and sickness)	Conducting training courses and meeting for the workers on safety and environmental hygienic Providing personal safety devices for workers safety boots, helmet, gloves, mask and protective cloths	-	-		RRVPNL/Techno
Nuisance to nearby properties	Losses to neighbouring land uses/ values	Contract clauses specifying careful construction practices. As much as possible existing access ways will be used. Productive land will be reinstated following	Contract clauses Design basis and layout Reinstatement of land status (area affected, m^2) Implementation of Tree/Crop compensation (amount paid)	Excavated material will be used for filling ground itself.	-	-		RRVPNL/Techno

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
		completion of construction Compensation will be paid for loss of production, if any.						
Operation and Maintenance Phase								
Electric shock	Death or injury to the workers and public	Security fences around substation Establishment of warning signs Careful design using appropriate technologies to minimise hazards	Proper maintenance of fences and sign boards Usage of appropriate technologies (lost work days due to illness and injuries)					
Noise generation	Nuisance to the community around the site	Provision of noise barriers near substation sites	Noise level					
Soil Erosion	Removal of top soil	Planting of buffer zone species suitable for arid climate.	Turbidity of water (Visual Inspection)					
Maintenance of Transmission line	Exposure to electromagnetic interference	Transmission line design to comply with the limits of electromagnetic interference from overhead power lines	Required ground clearance (metres)					
Substation maintenance	Exposure to electromagnetic interference	Substation design to comply with the limits of electromagnetic interference within floor area	Required vibrations level, instrumentation					
Oil spillage	Contamination of land/nearby water bodies	Substation transformers located within secure and impervious bundled areas with a storage capacity of at least 110% of the capacity of oil in transformers and associated reserve tanks.	Substation bounding ("as-built" diagrams)					
Operation of Switchgear	Leakage of SF6 gas	Record of all substation switchgear located within secure casings	Switchgear casings and Substation bounding					

B.3.2 Environment Monitoring Plan and Status on Implementation

Environmental component	Project stage	Parameters to be monitored	Sampling Location	Monitoring Frequency	Regulatory Standards for parameter	Agency responsible for implementation	Agency responsible for supervision	Test Results	Observations/Comments	Actions for Compliance	Further follow-up required
1.Air Quality	A. Pre construction stage (Baseline development)	PM_{10}, $PM_{2.5}$, SO_2, NOx, SPM, CO (Visible dust)	Boundary of substation	One time	Spot check using field portable instruments National Air quality standards of CPCB [PM10 or PM2.5]	RVPNL		Baseline data available – Annexure 3			
	B. Construction Stage	PM_{10}, $PM_{2.5}$, SO_2, NOx, SPM, CO (Visible dust)	Boundary of substation	Every one month of construction period	Spot check using field portable instruments National Air quality standards of CPCB [PM10 or PM2.5	Shall be done at earliest					
	C. Operation Stage (Testing and Commissioning)	PM_{10}, $PM_{2.5}$, SO_2, NOx, SPM, CO (Visible dust)	Boundary of substation	One time during commissioning	Spot check using field portable instruments National Air quality standards of CPCB [PM10 or PM2.5						
2.Water Quality	A. Pre construction stage (Baseline development)	EC, TSS, DO, BOD, P^H Oil and grease, Pb,	Nearest well near substations	One time	National water quality standards of CPCB	RVPNL		Baseline data available – Annexure 3			
	B. Construction Stage	EC, TSS, DO, BOD, P^H Oil and grease, Pb,	Nearest well near substations	One time during cable laying	National water quality standards of CPCB	Shall be done at earliest					

Environmental component	Project stage	Parameters to be monitored	Sampling Location	Monitoring Frequency	Regulatory Standards for parameter	Agency responsible for implementation	Agency responsible for supervision	Test Results	Observations/Comments	Actions for Compliance	Further follow-up required
	C. Operation Stage	EC, TSS, DO, BOD, P^H Oil and grease, Pb,	Nearest well near substations	One time during commissioning	National water quality standards of CPCB						
3.Noise/ Vibration	A. Pre construction stage (Baseline development)	Noise level [dB(A)]	Boundary of substation	One time	CPCB standards for Noise and vibrations	RVPNL		Baseline data available – Annexure 3			
	B. Construction Stage	Noise level [dB(A)]	Boundary of substation	Every one month of construction period	CPCB standards for Noise and vibrations	Shall be perform at earliest.					
	C. Operation Stage	Noise level [dB(A)]	Boundary of substation	One time during commissioning	CPCB standards for Noise and vibrations						
4. Soil	A. Pre construction stage (Baseline development)	Visible spills and/or soil staining, Oil & grease	1 location inside substation	One time	Hazardous Waste Management rules	RVPNL		Baseline data available – Annexure 3			
	B. Construction Stage	Visible spills and/or soil staining, Oil & grease	1 location inside substation	One time	Hazardous Waste Management rules	Shall be intimate at earliest					
	C. Operation Stage	Visible spills and/or soil staining, Oil & grease	1 location inside substation	One time during commissioning	Hazardous Waste Management rules						
SF6	Operation Stage	Volumetric loss from GIS equipment	Substation equipment, circuit breakers	Online monitoring by data loggers	As per Approved Specifications of Equipment	Techno		Techno at Testing and Commissioning Stage			

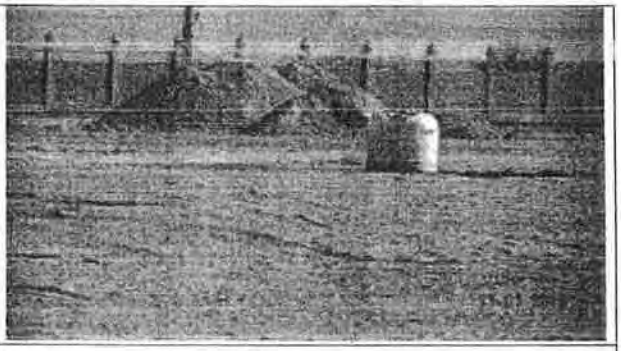
Abbreviations:

SO_2- .Sulphur Dioxide; NO_2. - Nitrogen Dioxide; CO- Carbon Monoxide; EC – Electric Conductivity;
Pb – Lead; $PM_{2.5}$ - Particulate Matter <2.5;PM_{10} - Particulate Matter <10; TSPM- Total suspended Particulate Matter;
EC - Electrical Conductivity; DO - Dissolved Oxygen; TSS - Total Suspended Solids;
SF_6 – Sulphur Hexafluoride gas
BOD - Biological Oxygen Demand; ORP – Oxidation Reduction Potential
NAAQS - National Ambient Air Quality Standards specified by CPCB, GoI;
NWQS - National Water Quality Standards specified by CPCB, GoI.

Annexure 1: Photographs regarding EMP issues

Photographs taken during the visit of ADB Consultant Team review

1.1 General Dust at the site



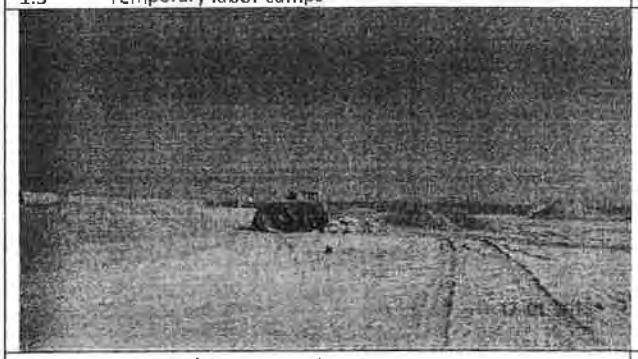
1.2 Temporary drinking water at site

1.3 Use of firewood collected and open bathing and washing areas

1.4 Open-work areas at site and no PPE used

1.5 Temporary labor camps

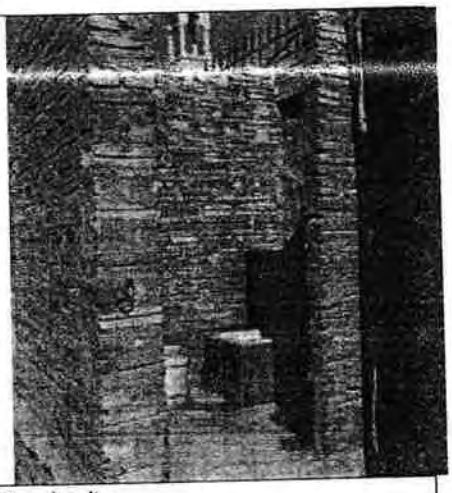
1.6 Firewood use inside kitchen



1.7 Storage of raw material at site

1.8 Un taped construction site.

1.9 Dust pollution during digging due to sandy soil



1.10 One toilet at the site

1.11 Augmentation at Akal Substation site

1.12 Foundation pit dug up at Akal Substation

Annexure 2:
RVPNL Letter dated 19.02.2016 regarding EMP issues

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED
OFFICE OF THE SUPTDG. ENGINEER (P&P)
Corporate Identity Number(CIN): U 40109RJ2000SGC016485
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NO.RVPN/SE(P&P)/XEN(ADB-I)/ICB-1/.D - 3089 Dated 19-02-16

M/s.Techno Electric and Engineering Co. Ltd.,
47,Mission Compound, 1st Floor,
Near Ajmer Pulia,Ajmer Road,
Jaipur

Sub:- To furnish information of environmental and social aspects in various ADB funded projects.(ICB-1).

Dear Sir(s)

The ADB consultant team for social & environmental monitoring have visited your site and have advised you certain improvement in your work activities which are essential to meet the ADB's social & environmental safeguard requirements.

You are advised to take note of the following:-

1. Proper PPE are supplied to the working staff.
2. Adequate numbers of toilets for workers are available at site.
3. Clean drinking water be properly placed at site & supplied to the workers.
4. Danger tape demarcation for all deep pit/foundation/work area.
5. First aid & medical kits are available at workers camp & site office.
6. Installation of safety placards depicting safely practise at site.
7. Water sprinkling on the areas where vehicles are moving inside the project area to avoid dust formation
8. Gas is used by all your staff at site instead of fire wood.
9. Proper waste management from your kitchen and associated activities.
10. Air,water,noise & soil parameters test reports are provided to the projects incharge as per the format provided by the visiting team.

The ADB mission from Delhi office shall be visiting the respective sites to review the adherence of the activities at site in compliance with their social & environmental safeguard policy. Kindly ensure strict compliance of the above.

(A.K. Sharma)
Superintending Engineer (P&P)
RVPN, Jaipur

Copy submitted to The Superintending Engineer (400 kV GSS) , RVPN Ramgarh/Jaisalmer for kind information.

Superintending Engineer (P&P)

Annexure 3
Baseline Test Reports (Tests done during IEE assessment in 2011-2012)

Location of Sampling along the associated Grid Substations (November 2011)

S. No	Component	No. of Sample	Report Reference No.	Sampling Location
1 and 2	for Air and Noise Monitoring	4 each	SS-1	GSS Sub Station Land, Khasara No. 8, Village: Bhadla, Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur
			SS – 2	400 KVA GSS Site, Village: Meyon Ki Dhani, Post: Ramgarh, Jaisalmer
			SS – 3	Near SE office 400 KVA (RRVPNL), Village: Akal, Post: Jodha, Jaisalmer
			SS – 4	GSS 400 kVA Site, Village: Kakani, Post and Tehsil: Luni, Jodhpur
3	Water Analysis	4	SS-1	Water sample collected from Bore well of Munna Ram Ji, Village: Bhadla (Khasra No.9), Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur
			SS – 2	Water sample collected from Govt. Bore well (Nearest Bore well GSS Ramgarh), Village and Post: Sonu, Tehsil: Ramgarh, District Jaisalmer
			SS – 3	Water sample collected from Govt. Bore well inside 400 KVA GSS (RRVPNL), Village: Akal, Post: Jodha, Jaisalmer
			SS – 4	Water sample collected from Open Well of Babu Singh Champavat, Village: Kakani, Post and Tehsil: Luni, Jodhpur
4	Soil Analysis	4	SS-1	Soil sample collected from the land of proposed GSS Sub Station, Khasara No. 8, Village: Bhadla, Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur
			SS – 2	Soil sample collected from the proposed Ramgarh GSS 400 KVA, Village and Post: Sonu, Tehsil: Ramgarh, District Jaisalmer
			SS – 3	Soil sample collected from the land of proposed GSS 400 KVA (RRVPNL), Village: Akal, Post: Jodha, Jaisalmer
			SS – 4	Soil sample collected from the land of Proposed GSS 400 KVA, Village: Kakani, Post and Tehsil: Luni, Jodhpur

A. AMBIENT AIR QUALITY MONITORING REPORT

i. Ambient Air Quality Monitoring Report for Grid Substations (November 2011)

Sample No	Site	Particulate Matter (PM 2.5)	Particulate Matter (PM 10)	Sulphur Dioxide (SO2)	Oxide of Nitrogen (NOX)	Carbon Monoxide as (CO)
SS - 1	GSS Sub Station Land, Khasara No. 8, Village: Bhadla, Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur	24.1 µg / m3	47.5 µg / m3	6.0 µg / m3	9.0 µg / m3	373 µg / m3
SS - 2	400 KVA GSS Site, Village: Meyon Ki Dhani, Post: Ramgarh, Jaisalmer	27.3 µg / m3	57.7 µg / m3	6.5 µg / m3	9.3 µg / m3	573 µg / m3
SS - 3	Near SE office 400 KVA (RRVPNL), Village: Akal, Post: Jodha, Jaisalmer	32.6 µg / m3	65.8 µg / m3	6.3 µg / m3	9.7 µg / m3	687 µg / m3
SS - 4	GSS 400 kVA Site, Village: Kakani, Post and Tehsil: Luni, Jodhpur	20.5 µg / m3	44.6 µg / m3	6.0 µg / m3	9.0 µg / m3	458 µg / m3
	Standard Value	60 µg / m3	100 µg / m3	80 µg / m3	80 µg / m3	2000 µg / m3
	Methods of Measurement	Gravimetric Method	Gravimetric Method	Improved West and Gaeke Method	Modified Jacob and Hochheiser Method	IS: 5182 – 1975 Part X

B. AMBIENT NOISE MONITORING REPORT

i. Ambient Noise Monitoring Report for Grid Substations (November 2011)

Sample No	Site	Ld (Day Equivalent)	Ln (Night Equivalent)	Ldn (Day-Night Equivalent)
SS - 1	GSS Sub Station Land, Khasara No. 8, Village: Bhadla, Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur	45.45	41.00	48.15
SS - 2	400 KVA GSS Site, Village: Meyon Ki Dhani, Post: Ramgarh, Jaisalmer	48.58	41.94	50.01
SS - 3	Near SE office 400 KVA (RRVPNL), Village: Akal, Post: Jodha, Jaisalmer	52.31	42.31	52.31
SS - 4	GSS 400 kVA Site, Village: Kakani, Post and Tehsil: Luni, Jodhpur	53.17	41.75	52.74

All results are in Decibel (dB) Unit

Ambient Air Quality Standards in respect of Noise

Area Code	Category of Area/Zone	Limits in dB(A) Leq *	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note

1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is defined as an area comprising not less than 100 metres around hospitals, educational institutions and courts. The silence zones are zones which are declared as such by the competent authority.
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

*dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing. A "decibel" is a unit in which noise is measured.
"A", in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.
Leq : It is an energy mean of the noise level, over a specified period.
Source: Ministry of Environment and Forests Notification, New Delhi, the 14 February, 2000 S.O. 123(E)

C. ANALYSIS REPORT OF SOIL

i. Analysis Report of Soil for Grid Substations (November 2011)

Parameters (Unit)	Unit	SS -1 Bhadla GSS	SS -2 Ramgarh GSS	SS -3 Akal GSS	SS 4 Jodhpur GSS at Kakani
Color	Visual Comparison	Light Brown	Light Brown	Light Brown	Light Brown
pH (1:5)	-	7.87	7.25	7.71	7.64
Conductivity(1:5)	(µS/cm)	141	823	203	388
Moisture	(%)	6.1	6.5	7.2	6.8
Chlorides as Cl	(%)	0.004	0.037	0.005	0.01
Sulphate as SO4	(%)	0.005	0.016	0.002	0.003
Total Carbonates	(%)	0.05	0.04	0.05	0.02
Total Soluble Solids	(%)	0.064	0.33	0.072	0.122
Total Organic Matter	(%)	0.13	0.14	0.07	0.08
Nitrogen as N	(%)	0.07	0.09	0.04	0.04
Phosphorus as P	(%)	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Potassium as K	(%)	0.012	0.04	0.024	0.012
Zinc	Mg / 100 Gm	BDL	BDL	BDL	BDL
Copper	Mg / 100 Gm	BDL	BDL	BDL	BDL
Chromium	Mg / 100 Gm	BDL	BDL	BDL	BDL
Cadmium	Mg / 100 Gm	BDL	BDL	BDL	BDL
Nickel	Mg / 100 Gm	BDL	BDL	BDL	BDL
Lead	Mg / 100 Gm	BDL	BDL	BDL	BDL

BDL* - Below Detectable Limit
All results are on dry basis.

D. ANALYSIS OF WATER QUALITY

i. Analysis of Water Quality Along the Grid Substation Sites (November 2011)

Sample No : SS-1: Water sample collected from Bore well of Munna Ram Ji, Village: Bhadla (Khasra No.9), Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur (for GSS Bhadla)

Parameter	Concentration	Standard Drinking water Specification as per IS – 10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
1.1.1.1.1 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7.8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	7.40	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	548.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983

Iron as Fe	0.10 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	775.76 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	2,532.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	110.40 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	66.64 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	166.34 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	7.56 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.33 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	404.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
Bacteriological Characteristics				
Coliform Organisms	6 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Sample No. SS – 2: Water sample collected from Govt. Bore well (Nearest Bore well GSS Ramgarh), Village and Post: Sonu, Tehsil: Ramgarh, District Jaisalmer

Parameter	**Concentration**	**Standard Drinking water Specification as per IS – 10500:1991 as amendment up to 3 July 2010**		**Protocol (Test Method)**
		Desirable Limit	**Permissible Limit in absence of alternate source**	
1.1.1.1.2 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	8.05	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	276.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.05 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	495.85 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	1,785.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	70.40 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	24.50 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	113.49 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	12.93 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.47 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C

Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	268.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
Bacteriological Characteristics				
Coliform Organisms	7 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Sample No. SS – 3: Water sample collected from Govt. Bore well inside 400 KVA GSS (RRVPNL), Village: Akal, Post: Jodha, District Jaisalmer

Parameter	Concentration	Standard Drinking water Specification as per IS – 10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
1.1.1.1.3 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	8.36	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	120.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.03 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	61.98 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	977.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	27.20 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	12.74 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	131.75 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	2.25 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	0.83 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	0.2 Mg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	204.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
Bacteriological Characteristics				
Coliform Organisms	6 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Sample No. SS – 4: Water sample collected from Open Well of Babu Singh Champavat Village: Kakani, Post and Tehsil: Luni, District Jodhpur

Parameter	Concentration	Standard Drinking water Specification as per IS – 10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
1.1.1.1.4 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	8.30	6.5 – 8.5	-	IS: 3025 Part 11 - 1984

Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	108.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.02 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	7.99 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	181.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	33.60 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	5.88 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	27.22 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	2.79 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	0.18 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	124.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
Bacteriological Characteristics				
Coliform Organisms	3 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Annexure 4: Techno Electric and Engineering Co. Limited Reply to RVPNL Letter dated 19.02.2016 regarding EMP issues

TECHNO ELECTRIC AND ENGINEERING CO. LTD.
47, Mission Compound • 1st Floor • Near Ajmer Pulia • Ajmer Road • Jaipur- 302 006 • Tel. 0141-4036962
Cell No. 9007059200 • E -Mail :tasab.majumdar@techno.co.in
ENGINEERS & CONSTRUCTORS

0706RA/16-17/203
May 05, 2016

The Superintending Engineer (P&P)
Rajasthan Rajya Vidyut Prasaran Nigam Limited
Janpath, Jyoti Nagar
Jaipur – 302 005

Kind Attn: Mr. A. K. Sharma

Sub: Site Visit by ADB's Officers at Ramgarh S/s
Ref: PO No. RVPN/Sr.AO/PPM/ICB-1/F.2039 (Supply)/D.1016 dtd. 27.02.15
PO No. RVPN/Sr.AO/PPM/ICB-1/F.2039 (Service)/D.1017 dtd. 27.02.15

Dear Sir,

We would like to inform that officers of Asian Development Bank were visited at Ramgarh Site on 17.01.16 & they made comment on certain issues at site in which we have attainted the following:

1. Construct of New 06 No. Toilet for Workers-**Constructed**
2. Providing of Cooking Gas for workers (avoiding the use of firewood)-**Provided**
3. Providing Helmet, Safety Shoes, Mask, Eye Glass, Hand Gloves in all workers-**Procured the materials & using by the worker**
4. Using of Caution Boards & Tape-**Maintained during Site Work**
5. Depute One No. Safety Engineer-**Available at Site**
6. Treatment of Waste Management-**Completed**
7. Purification of Drinking water for labour colony-**Done**
8. Providing separate Kitchen for workers-**Completed**
9. Water Sprinkling in site over dust-**Doing on regular basis**
10. Providing First Aid Box in labour colony-**Available**
11. Stacking of loose earths in one area-**Completed**
12. Provide tracking of vehicle movement in site-**Tracking on regular basis**
13. HIV awareness Program in monthly basis- **We are co-ordinating with the Local Doctor to visit at site once in a month**

This is for your kind information please & request you to kindly intimate to the ADB officers accordingly.

Thanking you & assuring of our best services at all times.

Yours faithfully,
For TECHNO ELECTRIC & ENGG. CO. LTD.

Arpan Dutta
Manager (Projects)

Registered Office: P-46A, Padha Bazar Lane • Kolkata 700001 • Tel 2220 4071/4472, 3021-2600 • Fax +91 33 2225 4479
Corporate Office & Electrical Division: 2F & 3F, Park Plaza, North Block, 71, Park Street, Kolkata-700 016 Tel: 3021-3000, 98310 50017-20, Fax: 033-2217-4197
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Annexure 5: PROGRESS REPORT- VENDOR ENGINEERING

SL. NO.	ITEM DESCRIPTION	VENDOR NAME	VENDOR APPROVAL STATUS	APPROVAL STATUS		REMARKS
				DRAWING /GTP SUBMISSION	DRAWING /GTP APPROVAL	
A.	**TRANSFORMER**					
1	**33/.433 kV, 800 kVA,** 250 kV BIL LT Transformer	TESLA	Vendor approval received on 19.10.15	04.11.15	27.11.15	Received at Site
2	**33/.433 kV, 630 kVA,** 170 kV BIL LT Transformer					
B.	**EQUIPMENTS**					
1	**Circuit Breaker**					
(a)	**420 kV,** 2000 Amp., 40 kA rupturing capacity circuit Breaker	CGL	Vendor approval received on 25.08.15	21.04.15	19.10.15	Received at Site
(b)	**420 kV,** 2000 Amp., 40 kA rupturing capacity circuit Breaker with **Closing Resistor** suitable for single and three phase rapid auto enclosing complete with mounting structures, foundation bolts and nuts and first filling of SF6 gas plus 20% spare gas including accessories and auxiliaries.					
(c)	420 kV, 2000 Amp., 40 kA rupturing capacity circuit Breaker for controlling Shunt Reactor (Bus Type) suitable for single and three phase rapid auto enclosing complete with mounting structures, foundation bolts and nuts and first filling of SF6 gas plus 20% spare gas including accessories and auxiliaries **(Modified for Microprocessor based Point of Wave Controller)**					
(d)	Microprocessor based point of **wave controller** for circuit breaker suitable for Bus shunt reactor					
(e)	**245 kV**, 2000 Amp. 40 kA rupturing capacity circuit breaker			21.04.15	19.10.15	
2	**Current Transformer**					
(i)	2000-1000-500/1-1-1-1-1 Amp. **420 kV** CT	Alstom	Vendor Approval	26.08.15	20.10.15	Manufacturing Clearance

SL. NO.	ITEM DESCRIPTION	VENDOR NAME	VENDOR APPROVAL STATUS	APPROVAL STATUS		REMARKS
				DRAWING /GTP SUBMISSION	DRAWING /GTP APPROVAL	
(ii)	2000-1000-500/1-1 Amp. 420 kV single phase two core Metering current transformers(0.2s Class).		received on 03.09.15			Issued & Part materials received at site
(iii)	2000-1000-500/1-1-1-1-1 Amp. **245 kV** CT	Mehru	Vendor Approval received on 25.02.16	16.10.15	30.03.16	
(iv)	2000-1000-500/1-1 Amp. 245 kV single phase two core Metering current transformers (0.2s Class)					
3	**Capacitive Voltage Transformer**					
(i)	**420 kV** single phase 4400 pF CVT	Alstom	Vendor Approval received on 03.09.15	26.08.15	20.10.15	Received at Site
(ii)	420 kV single phase 4400 pF CVT suitable for Metering with voltage ratio 400/0.11 kV and two secondary windings (0.2 Class).					
(iii)	**245 kV** single phase 4400 pF CVT					
(iv)	245 kV single phase 4400 pF CVT suitable for Metering voltage ratio 220/0.11 kV (0.2 Class)					
(v)	**36kV, 52kV class EMVT**	Kapco	Vendor Approval received on 02.09.15	20.07.15	19.10.15	Manufacturing Clearance Issued
4	**Isolator**					
(a)	**420 kV** 2000 Amp. Isolator with **Single E/S**	SIEMENS	Vendor Approval received	16.04.15	09.10.15	Received at Site
(b)	**420 kV** 2000 Amp. Isolator with **Double E/S**					
(c)	**245 kV** 2000 Amp. Isolator **without E/S**					
(d)	**245 kV** 2000 Amp.Isolator**with Single E/S**					
(e)	**245 kV** 2000 Amp. Isolator **with Double E/S**					
(f)	**245 kV** 2000 Amp. Isolator for **Tandem operation**					
(g)	**72.5 kV**, 800 Amp. Isolator **without E/S**					

SL. NO.	ITEM DESCRIPTION	VENDOR NAME	VENDOR APPROVAL STATUS	APPROVAL STATUS		REMARKS
				DRAWING /GTP SUBMISSION	DRAWING /GTP APPROVAL	
(h)	**Insulator** for the above	Modern Insulator	Vendor Approval received on 03.09.15	09.07.15	20.10.15	Received at Site
5	**Surge Arresters**					
(a)	**390 kV** lightning arresters	CGL	Vendor Approval received on 24.08.15	03.08.15	02.11.15	Received at Site
(b)	**198 kV** lightning arresters					
(c)	**120 kV** lightning arresters					
(d)	**42 kV, 52kV class** Lightning arresters					
6	**Wave Trap**					
(a)	400 kV, 1.0mH / 2000 A, Wave Traps	Alstom	Vendor Approval received on 03.09.15	26.08.15	20.10.15	Received at Site
(b)	220 kV, 0.5 mH / 2000 A Wave Traps					
C (1)	**CONTROL, RELAY & PROTECTION PANELS & ASSOCIATED MANDATORY SPARES/EQUIPMENTS**	Alstom	Vendor approval received	22.03.16	Ramgarh Materials received at site.	
C (2)	**SUBSTATION AUTOMATION SYSTEM**					
D.1	**PLCC EQUIPMENTS**	ABB	Vendor Approval received on 03.09.15	16.04.15	03.12.15	Materials received at site
2	**FOTE EQUIPMENT**	ABB		14.10.15	03.12.15	
E.	**BATTERY AND BATTERY CHARGER**					
1	220V, 600AH VRLA (maintenance free) Battery set (108 cells) along with accessories, stand etc.	Exide	Vendor Approval Received on 10.11.15	13.11.15	26.07.16	
2	220V, 100Amp/70Amp float cum boost Battery Charger (Separate sections for float and boost charging operation).	Statcon	Vendor Approval Received on 25.02.16	22.12.15		Awaited

SL. NO.	ITEM DESCRIPTION	VENDOR NAME	VENDOR APPROVAL STATUS	APPROVAL STATUS		REMARKS
				DRAWING /GTP SUBMISSION	DRAWING /GTP APPROVAL	
3	48V, 600AH VRLA (maintenance free) Battery set (23 Cells) along with accessories and stand.	Exide	Vendor Approval Received on 10.11.15	13.11.15	26.07.16	
4	50 V, SMPS battery charger of 100 Amp. DC Load capacity along with additional one No. 25 Amp. SMPS Module.	Statcon	Vendor Approval Received on 25.02.16	22.12.15		Awaited
F.	**LT SWITCHGEAR**					
A.	**AC DISTRIBUTION BOARD**					
1	415 V, 1000 A, AC Main switch board	UNILEC	Vendor Approval received on 03.09.15	03.07.15	16.11.15	Manufacturing Clearance Issued
2	415 V, 400 A, AC Distribution Board					
3	415 V, 400 A, Main lighting Distribution Board					
4	415 V, 200 A, Emergency lighting Distribution Board					
5	415 V Air conditioning distribution panel					
B.	**DC DISTRIBUTION BOARD**					
1	220 V, 400 A, DC Distribution Board	UNILEC				
2	50 V, 200 A, DC Distribution Board					
H.	**HARDWARES AND MECHANICAL/ELECTRICAL AUXILIARIES**					
1	**STRINGING HARDWARE** FOR 400KV & 220KV	EMTT	Vendor Approval received on 03.09.15	16.10.15	26.11.15	Ramgarh materials received at Site. The qty. for Akal is awaited due to EDEC not received
2	**STRINGING INSULATOR** FOR 400KV & 220KV					
3	**Long Rod Insulator** for the above	Moder Insulator	Vendor Approval received on 10.11.15	05.11.15 / 06.11.15	07.12.15	
4	**a) 400 kV** Bus Post Insulator stacks with corona ring	Moder Insulator	Vendor Approval received on 03.09.15	09.07.15	09.10.15	
	b) 245 kV Bus Post Insulators					

SL. NO.	ITEM DESCRIPTION	VENDOR NAME	VENDOR APPROVAL STATUS	APPROVAL STATUS		REMARKS
				DRAWING /GTP SUBMISSION	DRAWING /GTP APPROVAL	
	c) 72.5 kV Outdoor Post Insulators					
5	**400 kV** Corona bellow / sphere for 4" IPS Al. tube	Klemmen	Vendor Approval received on 29.12.15	27.11.15	08.03.16	
6	**a) 400 kV** clamps and connectors					
	b) 245 kV Clamps and Connectors					
	c) 72.5 kV Clamps & Connectors					
	d) All type clamp and connectors for **earthwire and GS flat**					
7	**a) 400 kV** Spacers(All types)					
	b) 245 kV Spacers (All types)					
8	Grounding Conductor (GS & MS flats of all sizes and Cu/Al Flexible braids)	RMSCO	Vendor Approval Received on 30.03.16			
9	(a) 40 mm dia MS Rod	Shree Krishna	Vendor Approval Received on 19.02.16			
	(b) 40 mm dia 3000 mm long MS rod (earth electrodes)	RMSCO	Vendor Approval Received on 30.03.16			
	(c) 40 mm dia, 3000 mm long GS pipe electrodes					
10	**a) 4" IPS** (EH) Al. Tube (OD. 114.2 mm, Thickness-8.51 mm)	Hindalco	Vendor Approval Received on 10.11.15	Under Inspection for Ramgarh Qty.		
	b) 3" IPS (EH) Al. Tube (OD. 73.03mm Thickness 7.01mm)					
11	**a)** Welding sleeves for 4" IPS Al. tube	Klemmen	Vendor Approval Received on 29.12.15	27.11.15	08.03.16	Ramgarh materials received at Site. The qty. for Akal is awaited due to EDEC not received
	b) Welding sleeves for 3" IPS Al. tube					
12	Bay Marshalling kiosks					
	a) For 400 kV	Unilec	Vendor Approval	19.10.15	21.12.15	
	b) For 220 kV					

SL. NO.	ITEM DESCRIPTION	VENDOR NAME	VENDOR APPROVAL STATUS	APPROVAL STATUS		REMARKS
				DRAWING /GTP SUBMISSION	DRAWING /GTP APPROVAL	
			Received on 10.11.15			
13	Earthwire tension clamps with D. Shackle assembly and earth bond	Klemmen	Vendor Approval Received on 29.12.15	27.11.15	08.03.16	Ramgarh materials received at Site. The qty. for Akal is awaited due to EDEC not received
14	Lugs to suit 10.98 mm GS Earthwire	NA				
15	Junction boxes	Unilec	Vendor Approval Received on 10.11.15	19.10.15	21.12.15	
16	**Cables (FRLS)**					
	(a)1.1 KV grade PVC insulated armoured control cables – Cu	Ashoka Industries	Vendor approval received on 02.08.16			
	(b) 1.1 kV grade XLPE / PVC insulated armoured Al. conductor power cable					
17	Double compression type cable gland for 1.1 kV grade insulated cables & its termination as per cable sizes.	Dowells	Vendor approval received on 20.06.16			
18	Crimping type cable lugs (Tinned copper) of size of cable as required.					
19	PVC Pipes for Laying cables as per IS 4985 (the sizes shall be recommended by the bidder)	Finolex	Vendor Approval Received			
20	MS Angle Flat and ISMC channel (All size)					
21	ACSR Moose conductor	Cabcon	Vendor Approval Received on 10.11.15	02.01.16	10.02.16	Ramgarh materials received at Site. The qty. for Akal is awaited due to EDEC not received
22	ACSR Tarantulla conductor					
23	10.98mm dia GS earth wire					
24	**72.5 kV,** 50 Amp. horn gap fuse unit (Three phase)					
I.	**ILLUMINATION SYSTEM**:-					

SL. NO.	ITEM DESCRIPTION	VENDOR NAME	VENDOR APPROVAL STATUS	APPROVAL STATUS		REMARKS
				DRAWING /GTP SUBMISSION	DRAWING /GTP APPROVAL	
i)	Lighting Fixture	Bajaj	Vendor Approval Received on 30.11.15			
ii)	Lighting Panel	Unilec	Vendor Approval Received on 10.11.15	19.10.15	21.12.15	
iii)	Mobile Flood Light Tower	Aska Safety	Vendor Approval Received on 29.03.16	05.11.15	13.04.16	
iv)	Ceiling Fan	CGL	Vendor Approval Received on 20.06.16			
J.	**FIRE FIGHTING SYSTEM**					
i)	Fire Fighting Panel	Unilec	Vendor Approval Received on 10.11.15	19.10.15	29.12.15	
ii)	Fire Fighting Pump	Flowmore	Vendor Approval Received on 30.11.15	15.04.16	08.08.16	
iii)	Gate Valve	H. Sarker		16.08.16	26.08.16	
iv)	Deluge Valve, Spray Nozzle & Detector	H.D. Fire	Vendor Approval Received on 29.12.15			
v)	Hydrant Valve, Fire Hose, Hose Box & GM Branch Pipe with Nozzle	Newage Fire	Vendor Approval Received on 18.02.16			
L (1)	**OIL PURIFICATION PLANT**	Fowler Westrup	Vendor Approval received on 17.09.15	07.10.15	06.11.15	Materials received at site
L (2)	**MOBILE CRANE**					

SL. NO.	ITEM DESCRIPTION	VENDOR NAME	VENDOR APPROVAL STATUS	APPROVAL STATUS		REMARKS
				DRAWING /GTP SUBMISSION	DRAWING /GTP APPROVAL	
M.	**STRUCTURES:**					
(A)	LATTICE STRUCTURE	MAN STRUCTURE	Vendor Approval received on 03.09.15	06.08.15 & 17.08.15		90% materials received at Site
(B)	PIPE STRUCTURES	Good Luck	Vendor Approval received	19.01.16		Received at Site
N-2	**TESTING AND MEASURING EQUIPMENTS**					
1	50 k-Ohms Earth Tester			28.07.16		APPROVAL AWAITED
2	Insulation Tester / Meggar (5 kV)					
3	Digital Multi-meter					
4	Digital Clamp Meter					
5	Analog Multi-meter					
6	**Universal ComputerizedRelay Test Kit** alongwith Laptop (Core 2 Duo, 2.4 GHz, 15" TFT, 160 GB HDD, 2 GB Ram, DVD R/W) and associated configuration software	Alstom/Megger				
7	Dew Point Meter			28.07.16		APPROVAL AWAITED
8	Contact Resistance Meter	Scope	Vendor approval received on 14.06.16			
9	Transformer oil break down Voltage Test Set					
10	Three Phase Transformer Turn Ratio Tester Meter					
11	SF6 Gas Leakage Detector					
12	Circuit Breaker Analyzer	Scope	Vendor approval received on 14.06.16			
13	SF6 Gas filling and evacuation Kit					
14	Portable Primary Injection Test kit					
15	Microprocessor Based Dielectric Strength Analyzer					

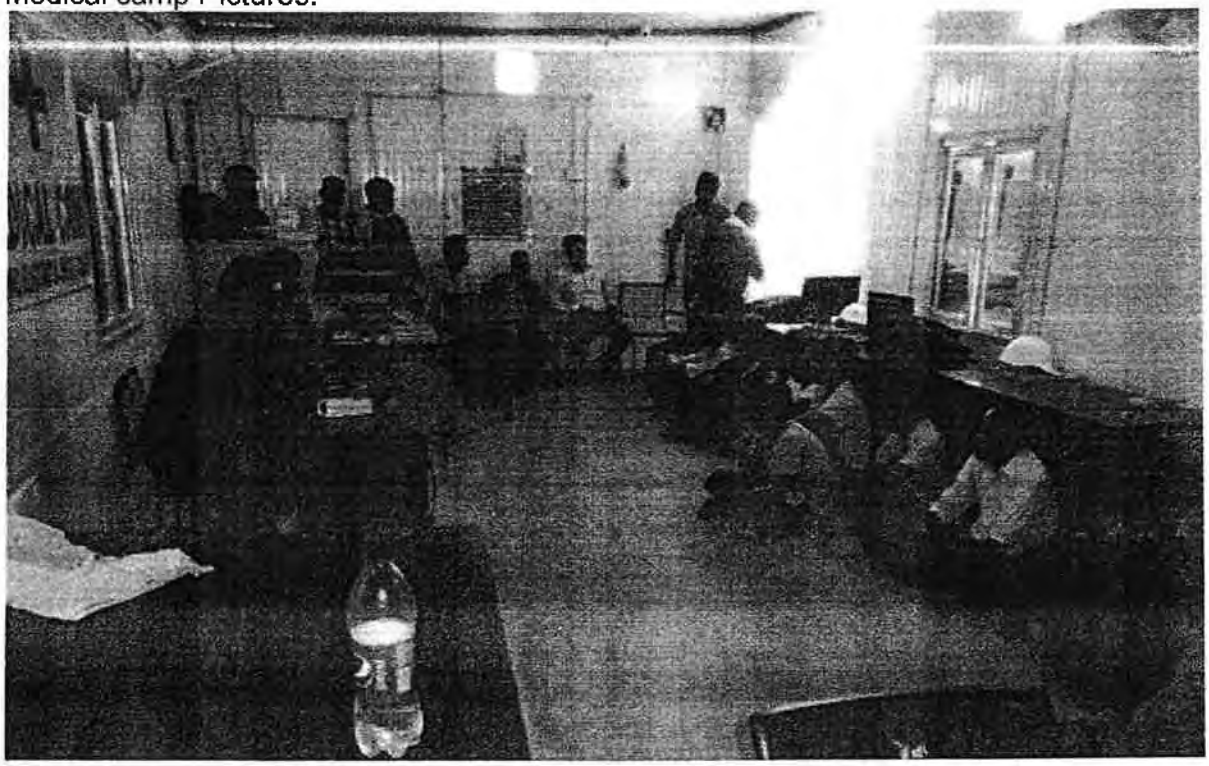
NOTE EDEC AWAITED FOR 3RD LOT

SITE PROGRESS REPORT FOR RAMGARH

Sl No	Item	Unit	Total Fdn/Qty	Cumm Progress				REMARKS
				Ex	PCC	Raft	Coln	
1	Geo Technical Investigation	LOT	1	Completed				
2	Contour and Site Levelling	LOT	1	Completed				
3	400kV Tower Foundation							
	Total		76	76	76	76	76	COMPLETED
	LM	Nos	19	19	19	19	19	
4	220kV Tower Foundation							
	Total	Nos	74	74	74	74	74	COMPLETED
5	400kV Equipment Foundation							
	Total	Nos	456	230	230	230	230	
6	220kV Equipment Foundation	Nos	420	219	211	211	211	
	220kV BPI Foundation	Nos	184	158	158	158	158	
	72.5 ISO	LOT	1					
	42KV,52KV CLASS LA	LOT	1					
	36 KV,52KV CLASS EMVT	LOT	3					
	72.5 KV POST INSULATOR	LOT	1					
7	500MVA, 400/220KV TRANSFORMER	Nos	3					Drawing Approval Awaited
8	50 MVAR 400 KV REACTOR FDN	Nos	2					
9	CABLE TRANCH	LOT	1	1115	930	895	885	
10	ROAD WORK	LOT	1					Drawing Approval

Sl No	Item	Unit	Total Fdn/Qty	Cumm Progress Ex	PCC	Raft	Coln	REMARKS
								Awaited
11	**FIRE WALL**	Nos	2					Drawing Approval Awaited
12	**CONTROL ROOM BUILDING**	LOT	1					
a)	Footing & Column up to bottom of PL	Nos	46	46	46	46	46	
b)	Plinth beam			Completed				
c)	Column up to Bottom of Roof Beam			Completed				
13	**400 KV BAY LEVEL KIOSK**	SET	8	8	8	8	8	
14	**220 KV BAY LEVEL KIOSK**	SET	9	9	9	9	9	
15	**Fire Fighting Pump House Building**	Nos	1					
16	**Store Room Building**	Nos	1					Drawing Approval Awaited
17	**SECURITY BUILDING**	Nos	1					Under progress
18	**CAR PARKING SHED**	Nos	1					
19	**YARD FENCING**	Nos	1					

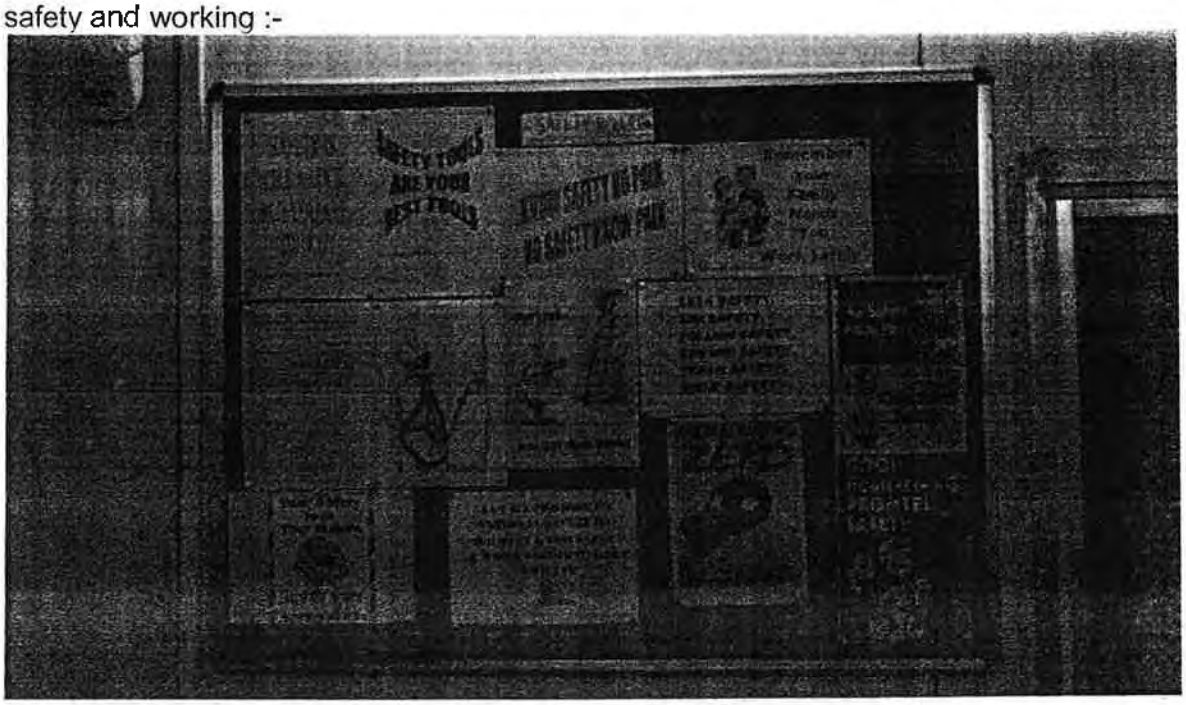
Medical camp Pictures:-




MEDICAL CAMP


MEDICAL CAMP

safety and working :-

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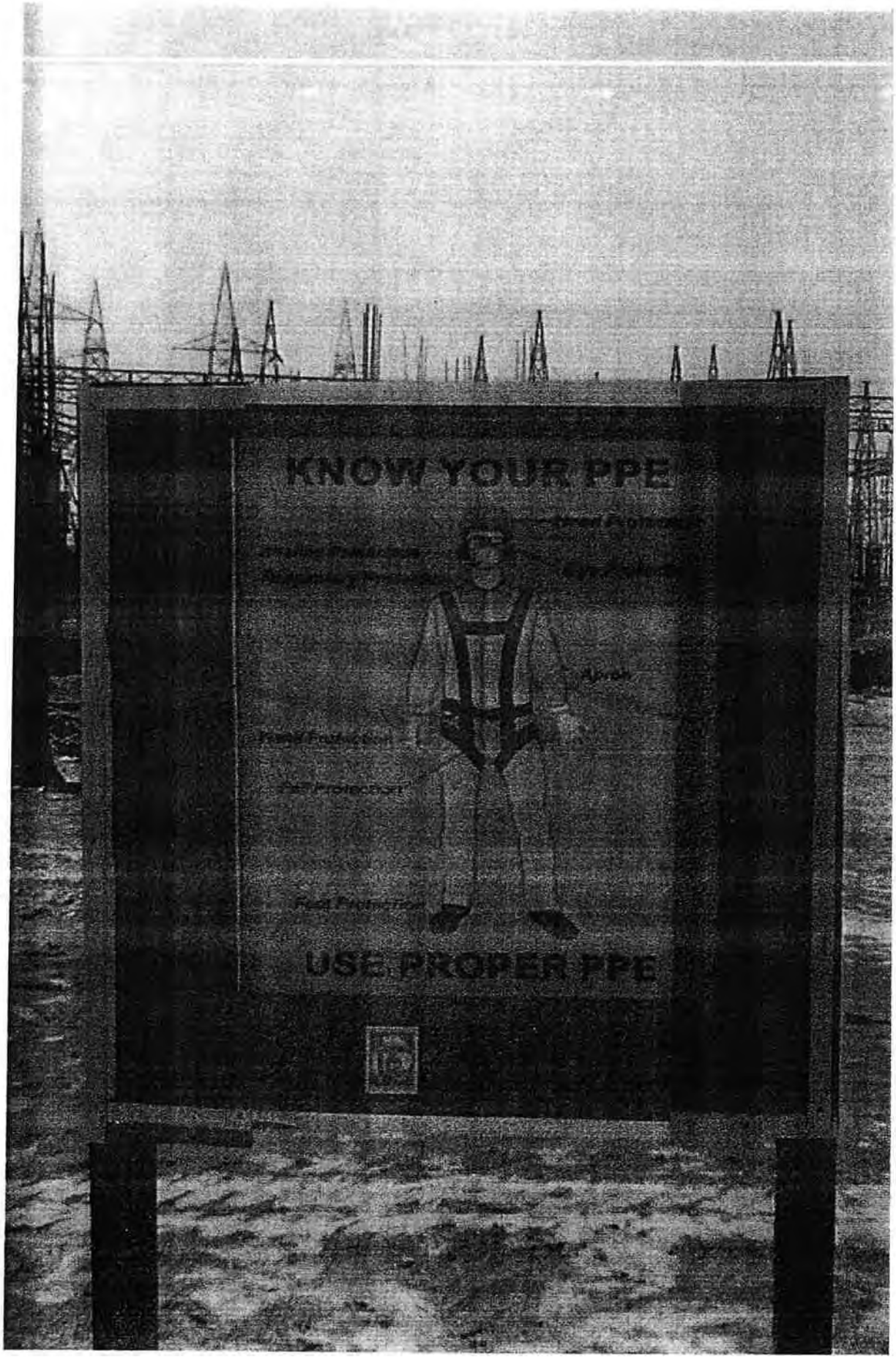
KNOW YOUR PPE
USE PROPER PPE

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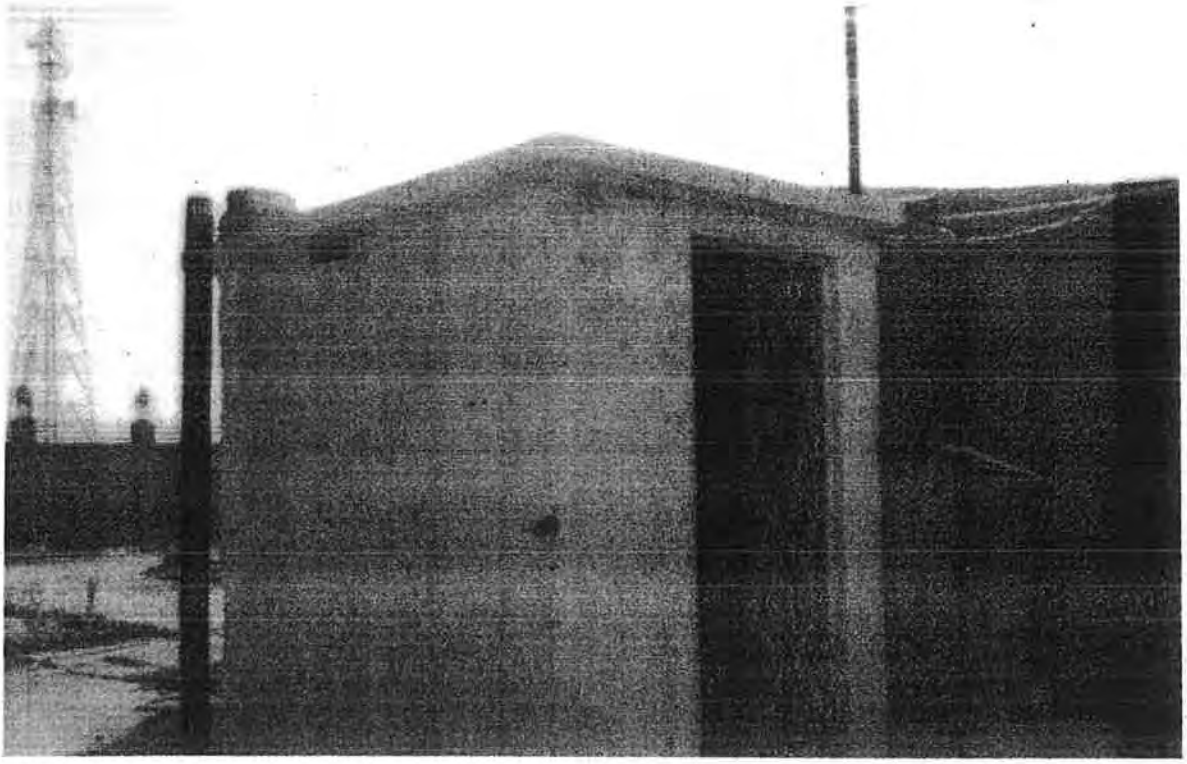

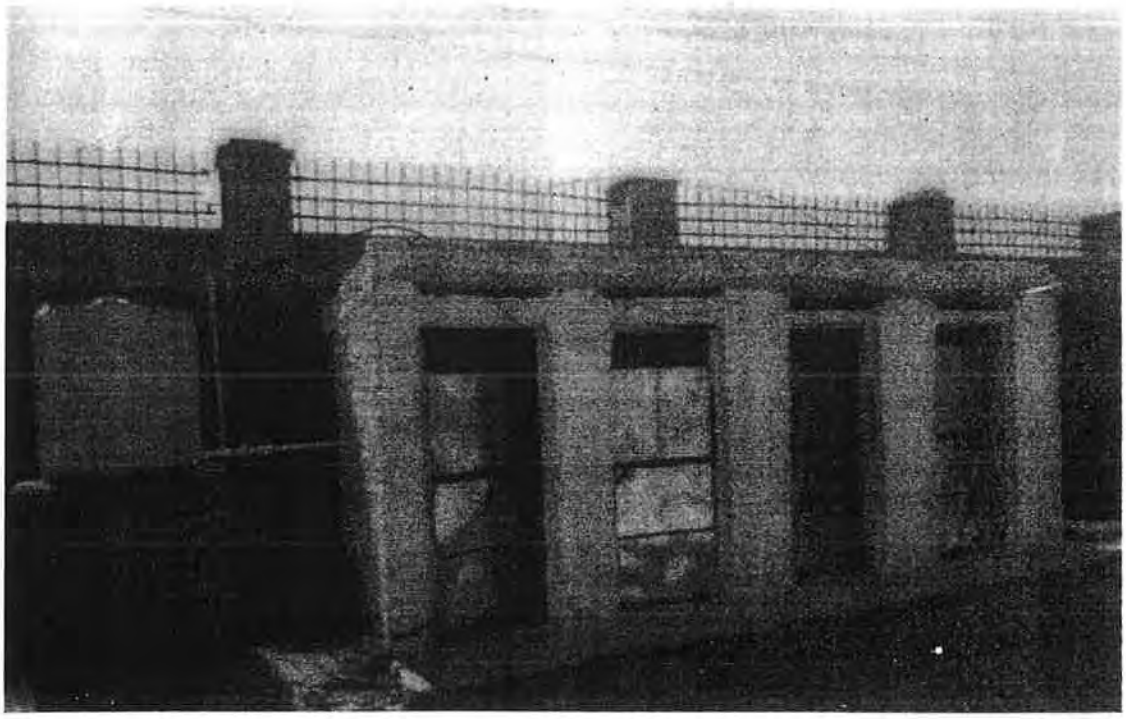

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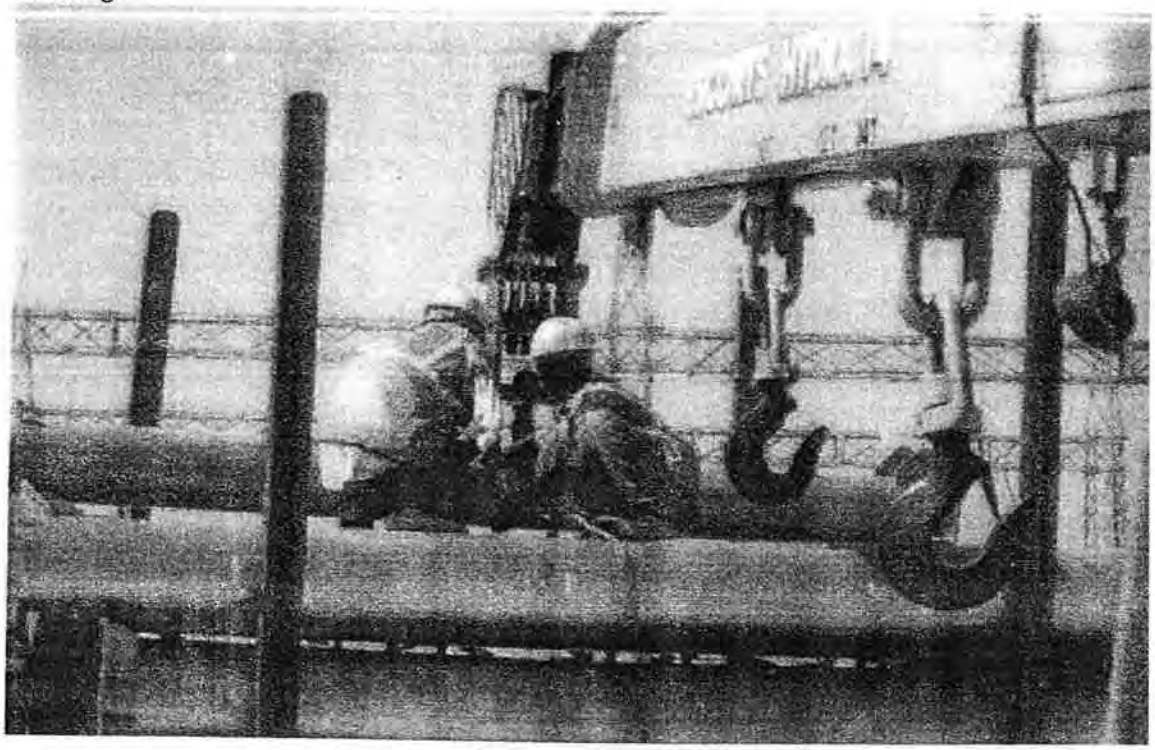
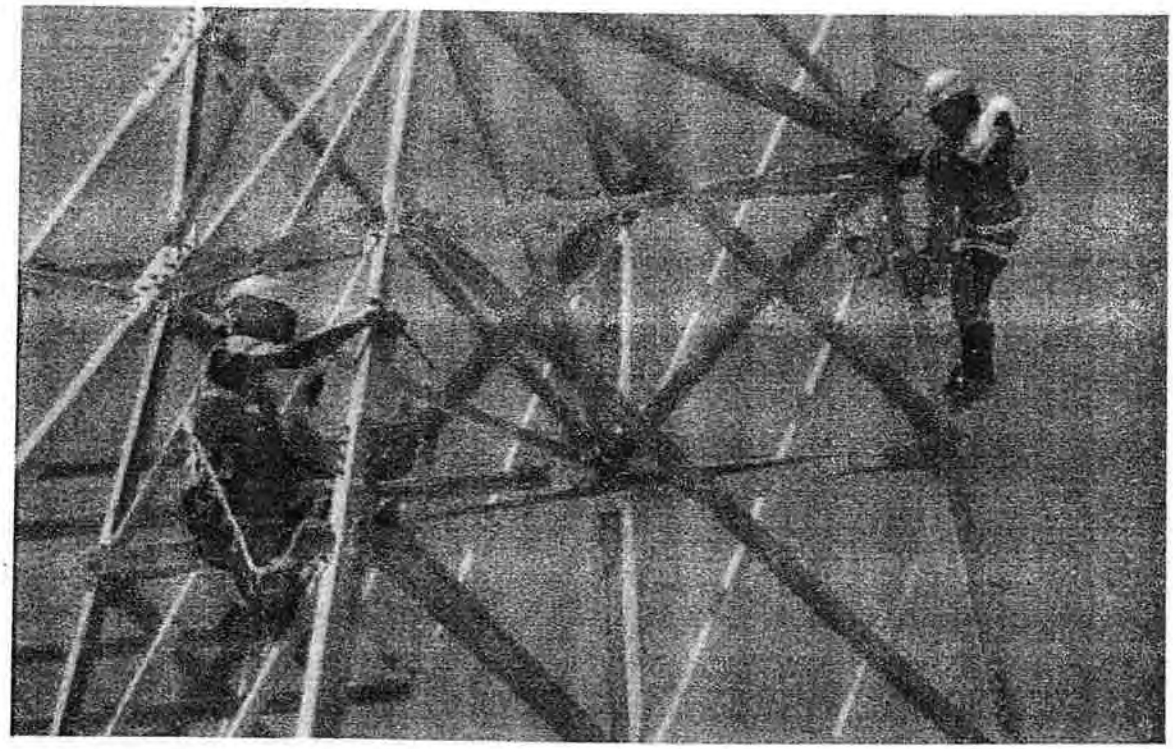




Environmental Safeguards Document

Ist
Environment Monitoring Report
For ICB 2: 400 kV Pooling Substation Bhadla& augmentation works at Bikaner GSS

Document Stage: Final Document
Project Number: 45224 (IND)
Period – March 2015 –March 2016.
Reporting – April -2016.

India: Rajasthan Renewable Energy Transmission Investment Program

Prepared for Asian Development Bank by Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL), Government of Rajasthan.

Environment Monitoring Report

Compliance Status & Monitoring Report of Environment Safeguards

Period: March 2015 –March 2016

Submitted by: Rajasthan Rajya Vidyut Prasaran Nigam Limited, Rajasthan

Table of Contents

Abbreviations

AP's	Affected Persons
C/o	Construction of
Deptt.	Department
Distt.	District
FCA	Forest Conservation Act
GIS	Gas Insulated Switchgear
GoI	Govt of India
GRC	Grievance Redressal Committee
Ha.	Hectare (10,000 sq. m. land)
IE Rule	Indian Electricity Rule
MOEFCC	Ministry of Forest, Environment and Climate Change
MPAF	Main Project Affected Family

Project Information

A.1. General

I	Name of Project	**Rajasthan Renewable Energy Transmission Investment Program**
II	Loan Number	Loan 3052-IND: Rajasthan Renewable Energy Transmission Investment Program - Tranche 1
II	Name of Monitoring/Reporting Agency and address	RRVPNL/VidutBhawan, Janpath, Jyoti Nagar Jaipur – 302005 Alstom T&D India Ltd. 910, OK Plus Tower, Govt. Hostel Circle, Near Vishal Mega Mart, Ajmer Road, Jaipur
III	Monitoring Period (Season/month)	Feb -2015 to Mar-2016
IV	Report No.	1
V	Report for the period	Feb -2015 to Mar-2016
VI	Date of reporting	April 2016.

A.2. Subproject details

	List of sub-projects	**Name of the Project site**
I	ICB 2: 400 kV Pooling Substation Bhadla & augmentation works at Bikaner	ICB 2: 400 kV Pooling Substation Bhadla & augmentation works at Bikaner under specification No. RRVPN / ADB / Tranche 1/ICB-2 (Supply & Service contract) to M/s. Alstom
II		Contract Agreement signed 18.03.2015
III		
IV		
V		
VI		

A.3. Overall Project Progress, Agreed Milestones and Implementation Schedules

S No	Stage of sub-project	Progress as on date of Report	Implementation Schedule
1	Design / Engineering	96%	18.03.15 to continue (Document detail Enclosed)
2	Civil work	60%	01.07.15 to Continue (Document detail Enclosed)
3	Supply order	85%	01.10.15 to Continue (Document detail Enclosed)
4	Erection	50%	13.03.16 to Continue(Document detail Enclosed)
5	Testing Commissioning		To be started
6			

B.1: Compliance Status with National/State/Local Statutory Environmental Requirements and international standards

S No	Legal Requirements/Acts/Rules/Guidelines	Applicable Attributes	RRVPNL 's Compliance Status
1	The Water (Prevention and Control of Pollution) Act, 1974 as amended;	Water Pollution	Preventive measures are being adopted to avoid such pollution. Report shall be submitted by Sept'2016.
2	The Air (Prevention and Control of Pollution) Act, 1981	Air Pollution	Preventive measures are being adopted to avoid such pollution. Report shall be submitted by Sept'2016.
3	The Environment (Protection) Act, 1986	Construction Practices	Report shall be submitted by Sept'2016.
4	The Environment Impact Assessment Notification, 1994 as amended	EMP monitoring	Report shall be submitted by Sept'2016.
5	The Hazardous Wastes (Management and Handling) Rules, 1989 as amended	Transformer Oil	Report shall be submitted by Sept'2016.
6	The Ozone Depleting Substances (Regulation and Control) Rules, 2000	Cleaning of electrical contacts using HFCs etc.	Report shall be submitted by Sept'2016.
7	The Batteries (Management and Handling) Rules, 2001 as amended	Batteries	Report shall be submitted by Sept'2016.
8	The Indian Forest Act, 1927 as amended	Reserve Forest areas, Right of way	Forest Land is not involved in the substation.
9	The Wild Life (Protection) Act, 1972 as amended	Critical habitats	No Wild life is involved in Project.
10	The Biological Diversity Act, 2002	Wetland	No Wetland is involved.
11	The Forest (Conservation) Act, 1980 as amended	Construction work in forest areas	Forest Land is not involved.
12	The National Environmental Policy, 2006 of GoI	Construction Practices	GOI norms for environmental management followed for all construction work
13	Other State Level Acts	Compensation	Compensation as per RRVPNL and state Revenue department.
14	Other International levels conventions and treaties	Biodiversity, GHG emissions	Not being affected.

B.2: General Implementation Status

B.2.1. Forest Clearance.

SN o.	Measures/ stipulation	Compliance Status
I	Sub-Project #	
1	Right of Way/ land required	Government Land
2	Clearance from trees	No trees on the site
3	Forest area and Nos. of trees.	No Forest land is being involved.
4	Damage to forest	No forest in the vicinity.
5	Wild life sanctuaries	No Wild life is involved in Project.

B.2.2. Fulfillment of commitments made during Public Hearing/Consultation

S.No.	Query/Apprehension	Commitment	Compliance Statement
I	Sub-project #		
1	Compensation for crop	As per EPC contractor bid	None
2	Compensation for land damages	As per EPC contractor bid	No land is damaged during the construction of boundary wall.Terminal gantry located

			inside boundary wall.
3	Compensation for pathways, channels for waterway.	Restoration after erection by EPC contractor	Till date no pathways, channels for waterways have been affected during the work. If affected, they shall be restored properly.
4	Nuisance due to dust, noise, vibrations, labor during construction	As per EMP implemented by EPC contractor	Preventive actions are being adopted to avoid such nuisance. Measures to reduce dust, noise, vibrations and labor problems currently. Report shall be submitted by Sept'2016.

B.2.3. ADB Stipulations/ safeguarding measures on Environment.

SNo.	Product Activity/Stage	Parameter to be monitored	Compliance Status
I	**Sub-Project #**		
	Construction		
1	Archeological site/ monument safety	Chance find	Not involved
2	Public places, schools, ponds, airport, railway etc.	Distance 500 m away	No school, ponds in the area.
3	Safeguard against critically endangered Flora and fauna.	Avoid	No Flora Fauna involved in project
4	Rain and Flood prone area.	Avoid	Not a flood prone area
5	Environmental parameters for air, noise, land and water during project construction	Environmental Monitoring Plan	Report shall be submitted by Sep'2016.

B.2.4 Record of complaints (regarding environment safeguard measures) and their resolution

Sr.No	Complainant Name and address	Date of receipt	Subject/Issue	Date of resolution	Remarks
I	**Sub-Project #**				
	As on date no complaint has been received				

B.2.5. Staffing, Institutional Arrangements and Grievance Redress

S.No.	Parameters	Commitment	Compliance Statement
1	Numbers of Staff deputed/employed for environment safeguards	One at -site	One Safety Officer
2	PIU established as per proposed institutional mechanism	Date	01-July-2015 (Refer Annexure-06 -Letter copy attached)
3	GRC formation	Shall to be formed by Sept'16	Project Engineer, Safety Head, and RVPNL JEN
4	Grievance Redress Mechanism followed	Proper record	Currently no environment related grievance received.

B.2.6. Other measures:

I	Sub-Project #
1	Safety Motivation Program for month of Dec. 2015 (RRVPNL Bhadla)
2	Risk Management for High-Risk Activities
3	Scaffolding Safety Training at Bhadla site
4	Machine Safety Training – 30 Nov 2015
5	Banksman Training – 02-12-2015
6	Incident communication & Vehicle movement awareness safety training – 03 -12- 2015

B2.8 Annexures

I	Sub-Project #
1	Photographs of the following – foundation construction, stores, toilets, drinking water, kitchen, safety workshop, training material for HSE etc.
2.	RVPNL Letter dated 19.02.2016 regarding EMP issues
3.	Baseline Report of Environmental Parameters (Pre-construction)
4.	Alstom Reply to RVPNL Letter dated 19.02.2016 regarding EMP issues: Remedial measures take from Alstom in response to Annexure 1 and 2 above.
5.	

B.3: Status of Implementation of Environment Management Plan (EMP) and Environment Monitoring Plan (EMoP)

B3.1. Environment Management Plan and Status on Implementation

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
Pre-construction								
Temporary use of land	Impact to the existing environment	Selection of lands adhering to local laws and regulations Construction facilities should be placed at least 500 m away from water bodies, natural flow paths, important ecological habitats and residential areas	water and air quality	Village areas are very far away	NA			RRVPNL
Substation location and design	Noise generation Exposure to noise, Nuisance to neighbouring properties	Substation designed to ensure noise will not be a nuisance.	Expected noise emissions based on substation design, noise levels	Village areas are very far away	Digging of foundations mostly in soil and no rock is there	NIL		RRVPNL
	Disturbance to the adjacent lands and the people due to cut and fill operations	Maintained adequate clearance, construction of retaining structures, minimise cut and fill operations adjoining to the dwellings	Setbacks to houses and other structures					
Location of transmission towers and transmission line alignment and design	Exposure to safety related risks	Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites.	Tower location and line alignment selection with respect to nearest dwellings	House/dwelling area very far away	NA	NA	NA	RRVPNL
	Impact on water bodies / land/ residences	Consideration of site location to avoid water bodies or agricultural land as much as possible. Careful site selection to avoid existing settlements	Site location, line alignment selection (distance to dwelling, water and/or agricultural land)	All the water bodies/dwellings are more than 500 mtrs away from the substation land	NA	-	-	RRVPNL
Equipment specifications and design parameters	Release of chemicals and harmful gases in receptors (air,	PCBs free substation transformers or other project facilities or equipment.	Transformers and specifications and compliance with setback distances	Equipment Design for substation submitted to RRVPNL for review	Design approved			RRVPNL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
	water, land)		("as-built" diagrams)					
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 siting of activities. Minimise the RoW wherever possible	Floral and faunal habitats loss	No ecological areas are involved in substation.		-	-	RRVPNL
Involuntary resettlement or land acquisition	Loss of lands and structures	Compensation paid for temporary/ permanent loss of productive land	Public complaints		NA	NA	-	RRVPNL
Encroachment into farmland	Loss of agricultural productivity	Use existing tower footings/towers wherever possible Avoid siting new towers on farmland wherever possible Farmers compensated for any permanent loss of productive land and trees that need to be trimmed or removed along RoW.	Tower location and line alignment selection Design of Implementation of crop and tree compensation (based on affected area) Statutory approvals for tree trimming /removal		NA	NA	NA	RRVPNL
Interference with drainage patterns/Irrigation channels	Temporary flooding hazards/loss of agricultural production	Appropriate sighting of towers to avoid channel interference Appropriate provision or excess soil dug up from the foundations/treriches	Site location and line alignment selection	Substation foundations are spotted beyond the boundaries of water channel.		278	-	RRVPNL
Explosions/Fire	Hazards to life	Design of substations to include modern fire control systems/firewalls. Provision of firefighting equipment to be located close to transformers,	Substation design compliance with fire prevention and control codes	Design of substation equipment approved by RRVPNL	Design approved			RRVPNL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
		power generation equipment.						
Construction								
Removal or disturbance to other public utilities	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 accidental damage to the public utilities Restore the utilities immediately to overcome public inconvenience	Disruption to other commercial and public activities / Public complaints	Advance notice will be published into the local newspaper for electric utility shutdown.	As construction area is quite isolated from community, there is certainly not Availability of public utilities nearby. A separate road has been already constructed by RRVPNL for local public Conveyance.		-	RRVPNL
Acquisition of cultivable lands	Loss of agricultural productivity	Avoid farming season wherever possible for the project activities. Ensure existing irrigation facilities are maintained in working condition Protect /preserve topsoil and reinstate after construction completed Repair /reinstate damaged bunds etc. after construction completed Compensation for temporary loss in agricultural production.	Land area of agriculture loss Usage of existing utilities Status of facilities (earthwork in m^3) Implementation of crop compensation (amount paid, dates, etc.)	No work locations in any farming area Top soil will be restored during the back filling work.			-	RRVPNL
Temporary outage of the electricity	Loss of power supply to the local community when distribution lines crossing the new transmission	Advance notice to the public about the time and the duration of the utility disruption Restore the utilities	Power disruption to houses and commercial premises of power disruption	Advance notice will be published into the local newspaper for electric utility shutdown.			-	RRVPNL

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
	line are switched off	immediately to overcome public inconvenience						
Equipment layout and installation	Noise and vibrations	Selection of construction techniques and machinery to minimise ground disturbance.	Construction techniques and machinery	Construction activity carried out during in day.	Using the DG set with acoustic enclosure. Other machinery with less noise.		-	RRVPNL
	SF6 leakage during storage and erection of Switchgear	Record of all substation switchgear, storage cylinders located within secure casings	Switchgear casings and substation bounding	No equipment supplied currently	Recently Alstom have received 9 bottles of SF6 with 220kv breaker. This has been already kept in store yard in a secured position.			
Substation construction	Loss of soil	Fill for the substation foundations obtained by creating or improving local drain system.	Borrow area sighting (area of site in m^2 and estimated volume in m^3)	Top soil retained inside substation	Excess soil shall be used in road construction at site only			
	Interference in drainage of rain and waste water at site	Removal of silt and trash choking the drainage of the substation land	Drains choked with rain/water due to silt and trash	None	Overall drainage system work in progress.			
	Water pollution	Construction activities involving significant ground disturbance (i.e. substation land forming) not undertaken during the monsoon season.	Water Quality (pH, BOD/COD, Suspended solids, other) during major earthworks	Testing to be done as per EMP requirement in March 2016	No ground water disturbance. Water Report Will be submitted by Sept'16			
Construction schedules	Noise nuisance to neighbouring properties	Minimize construction activities undertaken during the night and local communities informed of the construction schedule.	Timing of construction (noise emissions, [dB(a)])	Villages located very far away	No noisy activities carried out in Night.	-	-	RRVPNL/Alstom
Provision of	Nuisance to	Restrict construction	Timing of	No wild life area	-	-	-	RRVPNL/Alstom

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
facilities for construction workers	wildlife if the line construction crosses their migratory path	work during the known period of migration by any wildlife in the area	Construction	involved				
	Contamination of receptors (land, water, air)	Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities.	Amenities for Workforce facilities	Covered and fence wall around the worker living area. Worker have sufficient waste water collection system and septic camp.	Arrangement made at site	-	-	RRVPNL/Alstom
Surplus earthwork/soil	Runoff to cause water pollution, solid waste disposal	Excess fill from tower foundation excavation to be reused on site or disposed of next to roads or around houses, in agreement with the local community or landowners.	Location and amount (m^3) of fill disposal Soil disposal locations and volume (m^3)	Excess soil is dumped inside the substation and then used for fill inside.	Excess soil used for Road work inside substation	-	-	RRVPNL/Alstom
Air Pollution	Loose 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, tower locations, substation site	Lack of water leading to no spraying of water to minimize dust releasing in case of windy and dry weather.	Water spraying done at site.	-	-	RRVPNL/Alstom
Wood/ vegetation harvesting, cut and fill operations	Loss of vegetation and deforestation	Construction workers prohibited from harvesting wood in the project area during their employment.	Illegal wood /vegetation harvesting (area in m^2, number of incidents reported)	Firewood used, however LPG cylinder will be provided to Labor.	Now LPG cylinders are being used at site.	-	-	RRVPNL/Alstom
	Effect on fauna	Prevent work force from disturbing the flora, fauna including hunting of animal and fishing in water bodies. Proper awareness programme regarding conservation of flora, fauna including ground vegetation to all drivers, operators and other workers.	Habitat loss	Training program to be conducted to create awareness among the workers and staff to conserve the flora and funa.	Worker awareness program done to conserve the flora and funa.	-	-	RRVPNL/Alstom
Site clearance	Vegetation	Marking of vegetation to be removed prior to clearance, and strict	Vegetation marking and clearance control (area in m^2)	Vegetation land not involved at the substation line		-	-	RRVPNL/Alstom

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
		control on clearing activities to ensure minimal clearance.						
	Soil erosion and surface runoff	Construction near seasonal rivers, erosion and flood-prone areas (if any) should be restricted to the dry season. Provision and maintenance of drains and retention ponds. Treat clearing and filling areas against flow acceleration and construction work should be carefully designed to minimise obstruction or destruction to natural drainage.	Soil erosion	No soil erosion involve during the construction activity of substation.	No soil erosion involved at site.	-	-	RRVPNL/Alstom
Mechanised construction	Noise, vibration and operator safety, efficient operation Noise, vibration, equipment wear and tear	Construction equipment to be well maintained. Proper maintenance and turning off plant not in use.	Construction equipment - estimated noise emissions and operating schedules	Construction equipment is regularly maintained. Pollution under control certificate to be made available	Equipment fitness checked on regular basis.	-	-	RRVPNL/Alstom
Construction of roads for accessibility	Increase in airborne dust particles Increased land requirement for temporary accessibility	Existing roads and tracks used for construction and maintenance access to the site wherever possible. New access ways restricted to a single carriageway width within the Row.	Access roads, routes (length and width of access roads)	Existing road/path only used for the construction activity. Any new access path used is only one carriageway width for tractor, JCB machine and other machines.	Road constructed in inside substation.	-	-	RRVPNL/Alstom
Transportation and storage of materials	Nuisance to the general public	Transport loading and unloading of construction materials should not cause nuisance to the people by way of noise, vibration and dust	Water and Air Quality	Dropping material in the road collected. Construction material stored at high level	Construction material stored inside substation.	-	-	RRVPNL/Alstom

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
		Avoid storage of construction materials beside the road, around water bodies, residential or public sensitive locations Construction materials should be stored in covered areas to ensure protection from dust, emissions and such materials should be bundled in environment friendly and nuisance free manner		ground level at construction site. Construction material – sand will be covered at top to avoid air pollution and stacked top soil to be also covered at top to avoid blowing during windy conditions				
Trimming/cutting of trees within RoW	Fire hazards Loss of vegetation and deforestation	Trees allowed growing up to a height within the RoW by maintaining adequate clearance between the top of tree and the conductor as per the regulations. Trees that can survive trimming to comply with statutory distance should be lopped and not felled Felled trees and other cleared or pruned vegetation to be disposed of as authorised by the statutory bodies.	Species-specific tree retention as approved by statutory authorities (average and maximum tree height at maturity, in metres) Disposal of cleared vegetation as approved by the statutory authorities (area cleared in m^2)	NA	NA	-	-	
Health and safety ADD PPE	Injury and sickness of workers and members of the public	Contract provisions specifying minimum requirements for construction camps from water bodies, reserved areas etc. Contractor to prepare and implement a health and safety plan and	Contract clauses (number of incidents and total lost-work days caused by injuries and sickness)	Conducting training courses and meeting for the workers on safety and environmental hygienic Providing personal safety devices for workers safety boots, helmet, gloves, mask and protective cloths	Training conducted at site. All Personal protective equipment provide to workers.	-	-	RRVPNL/Alstom

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
		provide workers with required personal protective equipment (PPE) at site. Contractor to arrange for health and safety awareness programmes						
Nuisance to nearby properties	Losses to neighbouring land uses/ values	Contract clauses specifying careful construction practices. As much as possible existing access ways will be used. Productive land will be reinstated following completion of construction Compensation will be paid for loss of production, if any.	Contract clauses Design basis and layout Reinstatement of land status (area affected, m^2) Implementation of Tree/Crop compensation (amount paid)	Excavated material will be used for filling ground itself.	Excess soil used road construction work inside substation.	-	-	RRVPNL/Alstom
Operation and Maintenance Phase								
Electric shock	Death or injury to the workers and public	Security fences around substation Establishment of warning signs Careful design using appropriate Alstomlogies to minimise hazards	Proper maintenance of fences and sign boards Usage of appropriate Alstomlogies (lost work days due to illness and injuries)					
Noise generation	Nuisance to the community around the site	Provision of noise barriers near substation sites	Noise level					
Soil Erosion	Removal of top soil	Planting of buffer zone species suitable for arid climate.	Turbidity of water (Visual Inspection)					
Maintenance of Transmission line	Exposure to electromagnetic interference	Transmission line design to comply with the limits of electromagnetic interference from overhead power lines	Required ground clearance (metres)					

Project Activity	Potential Environmental Impact	Mitigation Action	Standards	Actions during reporting period (incl. corrective)	Cumulative Progress to date	Corrective Actions Required	Further Follow-up required	Institutional Responsibility
Substation maintenance	Exposure to electromagnetic interference	Substation design to comply with the limits of electromagnetic interference within floor area	Required vibrations level, instrumentation					
Oil spillage	Contamination of land/nearby water bodies	Substation transformers located within secure and impervious bundled areas with a storage capacity of at least 110% of the capacity of oil in transformers and associated reserve tanks.	Substation bounding ("as-built" diagrams)					
Operation of Switchgear	Leakage of SF6 gas	Record of all substation switchgear located within secure casings	Switchgear casings and Substation bounding					

B.3.2 Environment Monitoring Plan and Status on Implementation

Environmental component	Project stage	Parameters to be monitored	Sampling Location	Monitoring Frequency	Regulatory Standards for parameter	Agency responsible for implementation	Agency responsible for supervision	Test Results	Observations/Comments	Actions for Compliance	Further follow-up required
1.Air Quality	A. Pre construction stage (Baseline development)	PM_{10}, $PM_{2.5}$, SO_2, NOx, SPM, CO (Visible dust)	Boundary of substation	One time	Spot check using field portable instruments National Air quality standards of CPCB [PM10 or PM2.5]	RVPNL		Baseline data available – Annexure 3			
	B. Construction Stage	PM_{10}, $PM_{2.5}$, SO_2, NOx, SPM, CO (Visible dust)	Boundary of substation	Every one month of construction period	Spot check using field portable instruments National Air quality standards of CPCB [PM10 or PM2.5	Alstom		Will be submitted by Sept'16			
	C. Operation Stage (Testing and Commissioning)	PM_{10}, $PM_{2.5}$, SO_2, NOx, SPM, CO (Visible dust)	Boundary of substation	One time during commissioning	Spot check using field portable instruments National Air quality standards of CPCB [PM10 or PM2.5						
2.Water Quality	A. Pre construction stage (Baseline development)	EC, TSS, DO, BOD, P^H Oil and grease, Pb,	Nearest well near substations	One time	National water quality standards of CPCB	RVPNL		Baseline data available – Annexure 3			
	B. Construction Stage	EC, TSS, DO, BOD, P^H Oil and grease, Pb,	Nearest well near substations	One time during cable laying	National water quality standards of CPCB	Alstom		Will be submitted by Sept'16			
	C. Operation	EC, TSS,	Nearest	One time	National water						

Environmental component	Project stage	Parameters to be monitored	Sampling Location	Monitoring Frequency	Regulatory Standards for parameter	Agency responsible for implementation	Agency responsible for supervision	Test Results	Observations/Comments	Actions for Compliance	Further follow-up required
	Stage	DO, BOD, P^H Oil and grease, Pb,	well near substations	during commissioning	quality standards of CPCB						
3.Noise/ Vibration	A. Pre construction stage (Baseline development)	Noise level [dB(A)]	Boundary of substation	One time	CPCB standards for Noise and vibrations	RVPNL		Baseline data available – Annexure 3			
	B. Construction Stage	Noise level [dB(A)]	Boundary of substation	Every one month of construction period	CPCB standards for Noise and vibrations	Alstom		Will be submitted by Sept'16			
	C. Operation Stage	Noise level [dB(A)]	Boundary of substation	One time during commissioning	CPCB standards for Noise and vibrations						
4. Soil	A. Pre construction stage (Baseline development)	Visible spills and/or soil staining, Oil & grease	1 location inside substation	One time	Hazardous Waste Management rules	RVPNL		Baseline data available – Annexure 3			
	B. Construction Stage	Visible spills and/or soil staining, Oil & grease	1 location inside substation	One time	Hazardous Waste Management rules	Alstom		Will be submitted by Sept'16			
	C. Operation Stage	Visible spills and/or soil staining, Oil & grease	1 location inside substation	One time during commissioning	Hazardous Waste Management rules						
SF6	Operation Stage	Volumetric loss from GIS equipment	Substation equipment, circuit breakers	Online monitoring by data loggers	As per Approved Specifications of Equipment	Alstom		Alstom at Testing and Commissioning Stage			

Abbreviations:
SO_2- -Sulphur Dioxide; NO_2- - Nitrogen Dioxide; CO- Carbon Monoxide; EC – Electric Conductivity;

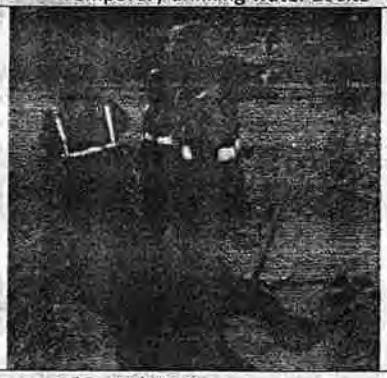
Pb – Lead; $PM_{2.5}$ - Particulate Matter <2.5;PM_{10} - Particulate Matter <10; TSPM- Total suspended Particulate Matter;
EC - Electrical Conductivity; DO - Dissolved Oxygen; TSS - Total Suspended Solids;
SF_6 – Sulphur Hexafluoride gas
BOD - Biological Oxygen Demand; ORP – Oxidation Reduction Potential
NAAQS - National Ambient Air Quality Standards specified by CPCB, GoI;
NWQS - National Water Quality Standards specified by CPCB, GoI.

Annexure 1: Photographs regarding EMP issues
Photographs taken during the visit of ADB Consultant Team review

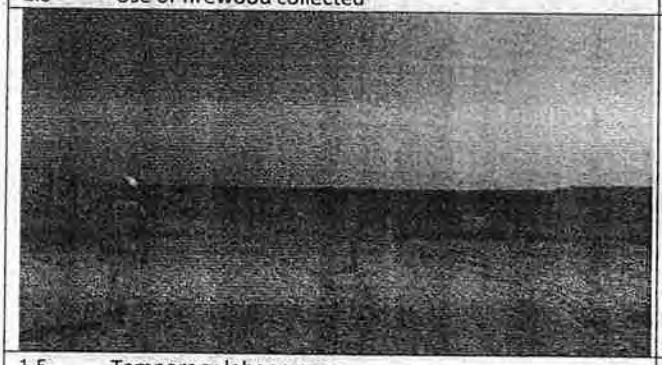
1.1 General site situation

1.2 Temporary drinking water at site

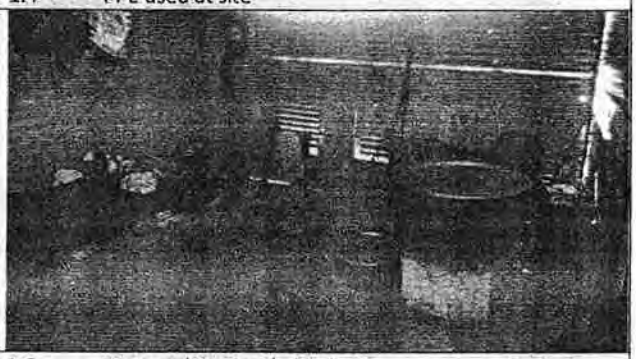
1.3 Use of firewood collected



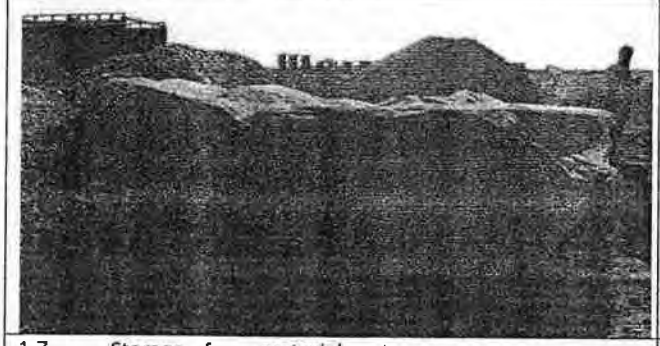
1.4 PPE used at site



1.5 Temporary labor camps

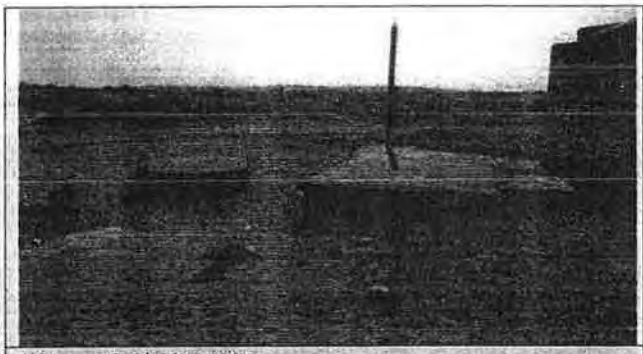
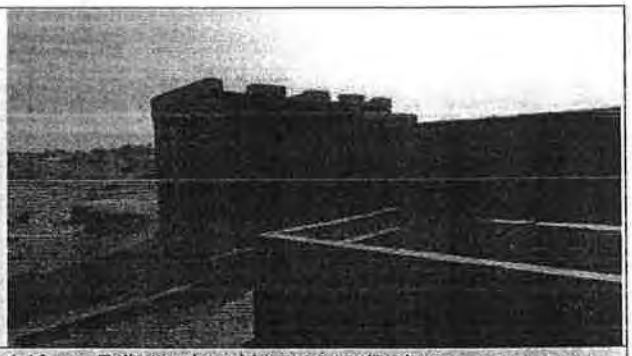
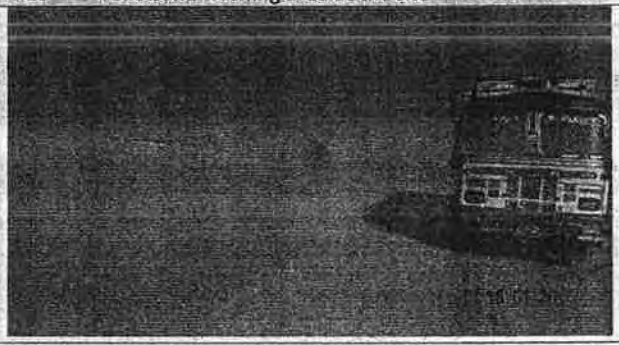
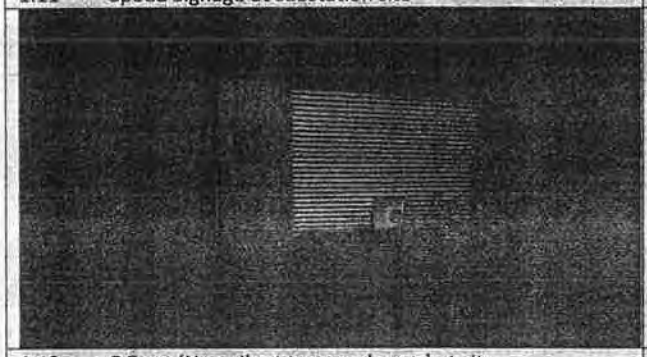


1.6 Firewood use inside kitchen



1.7 Storage of raw material at site

1.8 Barricaded construction site.

	
1.9 Soak pits at site	1.10 Toiletsand washing area at the site
	
1.11 Speed Signage at substation site	1.12 Fixed tracks for transportation inside substation
	
1.13 DG set (Non-silent type enclosure) at site	1.14 Waste Bin at site

Annexure 2:
RVPNL Letter dated 19.02.2016 regarding EMP issues

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED
OFFICE OF THE SUPTDG. ENGINEER (P&P)
Corporate Identity Number(CIN): U 40109RJ2000SGC016485
Regd. Office: Vidyut Bhawan, Janpath, Jaipur, Rajasthan (India)-302005
Tel: 91-141-2740373 2740381 Ext1336, Fax: 91-141-2740794
E-Mail: se_p&p@rvpn.co.in

NO.RVPN/SE(P&P)/XEN(ADB-I)/ICB-2/.D. 3088 Dated 19-02-16

M/s.Alstom T&D India Ltd.,
910, OK Plus Tower, Govt. Hostel Circle,
Near Vishal Mega Mart, Ajmer Road, Jaipur – 302 001.

Sub:- To furnish information of environmental and social aspects in various ADB funded projects.(ICB-2)

Dear Sir(s)

The ADB consultant team for social & environmental monitoring have visited your site and have advised you certain improvement in your work activities which are essential to meet the ADB's social & environmental safeguard requirements.

You are advised to take note of the following:-

1. Silent DG set is installed at site.
2. Water sprinkling on the areas where vehicles are moving inside the project area to avoid dust formation
3. Gas is used by all your staff at site instead of fire wood.
4. Proper waste management from your kitchen and associated activities.
5. Air,water,noise & soil parameters test reports are provided to the projects incharge as per the format provided by the visiting team.

The ADB mission from Delhi office shall be visiting the respective sites to review the adherence of the activities at site in compliance with their social & environmental safeguard policy. Kindly ensure strict compliance of the above.

(A.K. Sharma)
Superintending Engineer (P&P)
RVPN, Jaipur

Copy submitted to The Superintending Engineer (400 kV GSS) ,RVPN Bhadla for kind information.

Superintending Engineer (P&P)

Annexure 3
Baseline Test Reports (Tests done during IEE assessment in 2011-2012)

Location of Sampling Inside the Bhadla Solar Park (November 2011)

S. No	Component	No. of Sample	Report Reference No.	Sampling Location
1 and 2	Air Monitoring and Noise Monitoring	6	AN - 1	Near Munna Ram's tube well
			AN – 2	Near Sarpanch (Mathar Khan's House) Churon Ki Basti
		6	AN - 3	GSS Bhadla Substation land
			AN - 4	Near ArniyokiNadi
			AN - 5	Near PannukiNadi
			AN -6	Near Mile stone of 0 km Bhadla Fanta on Nachna – Bhikampur road
3	**Water Analysis**	3	WS - 1	Munna Ram's tube well
			WS – 2	Govt. tube well Churon Ki Basti
			WS - 3	Water tank at Kamrudeen House in GamnokiBasti
4	**Soil Analysis**	3	SS - 1	GSS Bhadla Substation land
			SS – 2	Near ArniyokiNadi
			SS - 3	Near PannukiNadi

Location of Sampling along the associated Grid Substations (November 2011)

S. No	Component	No. of Sample	Report Reference No.	Sampling Location
1 and 2	for Air and Noise Monitoring	4 each	SS-1	GSS Sub Station Land, Khasara No. 8, Village: Bhadla, Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur
3	**Water Analysis**	4	SS-1	Water sample collected from Bore well of Munna Ram Ji, Village: Bhadla (Khasra No.9), Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur
4	**Soil Analysis**	4	SS-1	Soil sample collected from the land of proposed GSS Sub Station, Khasara No. 8, Village: Bhadla, Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur

A. AMBIENT AIR QUALITY MONITORING REPORT

i. Ambient Air Quality Monitoring Report for Solar Park at Bhadla (November 2011)

S. No	Site	Particulate Matter (PM 2.5)	Particulate Matter (PM 10)	Sulphur Dioxide (SO2)	Oxide Of Nitrogen (NOX)	Carbon Monoxide as (CO)
AN -1	Near House of Munna Ram Ji	26.5 µg / m3	53.1 µg / m3	6.2 µg / m3	9.3 µg / m3	573 µg / m3
AN –2	Near House of Mathar Khan (Sarpanch), Chudon Ki Basti	31.4 µg / m3	58.6 µg / m3	6.3 µg / m3	9.1 µg / m3	458 µg / m3
AN -3	GSS Sub Station Land	24.1 µg / m3	47.5 µg / m3	6.0 µg / m3	9.0 µg / m3	373 µg / m3
AN -4	Arniya Ki Nadi	29.4 µg / m3	56.8 µg / m3	6.3 µg / m3	9.2 µg / m3	458 µg / m3
AN -5	Panna Ki Nadi	25.3 µg / m3	50.8 µg / m3	6.0 µg / m3	9.0 µg / m3	458 µg / m3
AN -6	0 km Mile stone of Bhadla at Badhla Fanta	21.4 µg / m3	43.6 µg / m3	6.0 µg / m3	9.0 µg / m3	373 µg / m3
	Standard Value	60 µg / m3	100 µg / m3	80 µg / m3	80 µg / m3	2000 µg / m3
	Methods of Measurement	Gravimetric Method	Gravimetric Method	Improved West and Gaeke Method	Modified Jacob and Hochheiser Method	IS: 5182 – 1975 Part X

ii. Ambient Air Quality Monitoring Report for Grid Substations (November 2011)

Sample No	Site	Particulate Matter (PM 2.5)	Particulate Matter (PM 10)	Sulphur Dioxide (SO2)	Oxide of Nitrogen (NOX)	Carbon Monoxide as (CO)
SS - 1	GSS Sub Station Land, Khasara No. 8, Village: Bhadla, Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur	24.1 µg / m3	47.5 µg / m3	6.0 µg / m3	9.0 µg / m3	373 µg / m3
SS - 2	400 KVA GSS Site, Village: Meyon Ki Dhani, Post: Ramgarh, Jaisalmer	27.3 µg / m3	57.7 µg / m3	6.5 µg / m3	9.3 µg / m3	573 µg / m3
SS - 3	Near SE office 400 KVA (RRVPNL), Village: Akal, Post: Jodha, Jaisalmer	32.6 µg / m3	65.8 µg / m3	6.3 µg / m3	9.7 µg / m3	687 µg / m3
SS - 4	GSS 400 kVA Site, Village:	20.5 µg / m3	44.6 µg / m3	6.0 µg / m3	9.0 µg / m3	458 µg / m3

Sample No	Site	Particulate Matter (PM 2.5)	Particulate Matter (PM 10)	Sulphur Dioxide (SO2)	Oxide of Nitrogen (NOX)	Carbon Monoxide as (CO)
	Kakani, Post and Tehsil: Luni, Jodhpur					
	Standard Value	60 µg / m3	100 µg / m3	80 µg / m3	80 µg / m3	2000 µg / m3
	Methods of Measurement	Gravimetric Method	Gravimetric Method	Improved West and Gaeke Method	Modified Jacob and Hochheiser Method	IS: 5182 – 1975 Part X

B. AMBIENT NOISE MONITORING REPORT

i. Ambient Noise Monitoring Report for Solar Park (November 2011)

S. No	Site	Ld (Day Equivalent)	Ln (Night Equivalent)	Ldn (Day-Night Equivalent)
AN -1	Near House of Munna Ram	47.15	41.57	49.16
AN –2	Near House of Mathar Khan (Sarpanch), Chudon Ki Basti	47.35	41.87	49.42
AN -3	GSS Sub Station Land	45.45	41.00	48.15
AN -4	Amiya Ki Nadi	47.53	41.71	49.40
AN -5	Panna Ki Nadi	47.47	40.77	48.87
AN -6	0 km Mile stone of Bhadla at Badhla Fanta	44.20	40.31	47.27

ii. Ambient Noise Monitoring Report for Grid Substations (November 2011)

Sample No	Site	Ld (Day Equivalent)	Ln (Night Equivalent)	Ldn (Day-Night Equivalent)
SS - 1	GSS Sub Station Land, Khasara No. 8, Village: Bhadla, Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur	45.45	41.00	48.15
SS - 2	400 KVA GSS Site, Village: Meyon Ki Dhani, Post: Ramgarh, Jaisalmer	48.58	41.94	50.01
SS - 3	Near SE office 400 KVA (RRVPNL), Village: Akal, Post: Jodha, Jaisalmer	52.31	42.31	52.31
SS - 4	GSS 400 kVA Site, Village: Kakani, Post and Tehsil: Luni, Jodhpur	53.17	41.75	52.74

All results are in Decibel (dB) Unit

Ambient Air Quality Standards in respect of Noise

Area Code	Category of Area/Zone	Limits in dB(A) Leq *	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note

1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is defined as an area comprising not less than 100 metres around hospitals, educational institutions and courts. The silence zones are zones which are declared as such by the competent authority.
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

*dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing. A "decibel" is a unit in which noise is measured.

"A", in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq : It is an energy mean of the noise level, over a specified period.

Source: Ministry of Environment and Forests Notification, New Delhi, the 14 February, 2000 S.O. 123(E)

C. ANALYSIS REPORT OF SOIL

i. Analysis Report of Soil for Solar Park (November 2011)

Parameters (Unit)	Unit	SS -1: GSS Sub Station	SS -2 Near Arniya Ki Nadi	SS – 3: Near Pannu Ki Nadi
Color	Visual Comparison	Light Brown	Light Brown	Light Brown

pH (1:5)	-	7.87	7.86	7.56
Conductivity(1:5)	(µS/cm)	141	132	291
Moisture	(%)	6.1	4.8	5.3
Chlorides as Cl	(%)	0.004	0.002	0.004
Sulphate as SO4	(%)	0.005	0.001	0.005
Total Carbonates	(%)	0.05	0.04	0.05
Total Soluble Solids	(%)	0.064	0.036	0.136
Total Organic Matter	(%)	0.13	0.04	0.11
Nitrogen as N	(%)	0.07	0.03	0.09
Phosphorus as P	(%)	< 0.0005	< 0.0005	< 0.0005
Potassium as K	(%)	0.012	0.013	0.025
Zinc	Mg / 100 Gm	BDL	BDL	BDL
Copper	Mg / 100 Gm	BDL	BDL	BDL
Chromium	Mg / 100 Gm	BDL	BDL	BDL
Cadmium	Mg / 100 Gm	BDL	BDL	BDL
Nickel	Mg / 100 Gm	BDL	BDL	BDL
Lead	Mg / 100 Gm	BDL	BDL	BDL

BDL* - Below Detectable Limit

ii. **Analysis Report of Soil for Grid Substations (November 2011)**

Parameters (Unit)	Unit	SS -1 Bhadla GSS
Color	Visual Comparison	Light Brown
pH (1:5)	-	7.87
Conductivity(1:5)	(µS/cm)	141
Moisture	(%)	6.1
Chlorides as Cl	(%)	0.004
Sulphate as SO4	(%)	0.005
Total Carbonates	(%)	0.05
Total Soluble Solids	(%)	0.064
Total Organic Matter	(%)	0.13
Nitrogen as N	(%)	0.07
Phosphorus as P	(%)	< 0.0005
Potassium as K	(%)	0.012
Zinc	Mg / 100 Gm	BDL
Copper	Mg / 100 Gm	BDL
Chromium	Mg / 100 Gm	BDL
Cadmium	Mg / 100 Gm	BDL
Nickel	Mg / 100 Gm	BDL
Lead	Mg / 100 Gm	BDL

BDL* - Below Detectable Limit
All results are on dry basis.

D. **ANALYSIS Of WATER QUALITY**

i. **Analysis of Water Quality Within Solar Park (November 2011)**

Water sample collected from Govt. Bore well, ChuronkiBasti

Parameter	Concentration	Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983

Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	7.97	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	588.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.06 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	443.86 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	2,674.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	136.00 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	60.76 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	137.03 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	8.54 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.31 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	372.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
Bacteriological Characteristics				
Coliform Organisms	19 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Water sample collected from Cement Tank (Kharuddin S/o Shri Kalu Khan, GamnokiBasti

Parameter	**Concentration**	**Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010**		**Protocol (Test Method)**
		Desirable Limit	**Permissible Limit in absence of alternate source**	
Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	7.81	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	552.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.08 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	851.74 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	2,652.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	118.40 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	62.72 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	147.94 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	8.94 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.21 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994

Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	292.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
Bacteriological Characteristics				
Coliform Organisms	12 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

ii. Analysis of Water Quality Along the Grid Substation Sites (November 2011)

Sample No : SS-1: Water sample collected from Bore well of Munna Ram Ji, Village: Bhadla (Khasra No.9), Post: Nuro Ki Burj, Tehsil: Phalodi, District Jodhpur (for GSS Bhadla)

Parameter	**Concentration**	**Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010**		**Protocol (Test Method)**
		Desirable Limit	**Permissible Limit in absence of alternate source**	
1.1.1.1.1 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	7.40	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	548.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.10 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	775.76 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	2,532.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	110.40 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	66.64 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	166.34 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	7.56 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.33 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	404.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986

Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
Bacteriological Characteristics				
Coliform Organisms	6 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Sample No. SS – 2: Water sample collected from Govt. Bore well (Nearest Bore well GSS Ramgarh), Village and Post: Sonu, Tehsil: Ramgarh, District Jaisalmer

Parameter	**Concentration**	**Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010**		**Protocol (Test Method)**
		Desirable Limit	**Permissible Limit in absence of alternate source**	
1.1.1.1.2 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	8.05	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	276.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.05 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	495.85 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	1,785.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	70.40 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	24.50 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	113.49 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	12.93 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.47 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	258.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986

Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
Bacteriological Characteristics				
Coliform Organisms	7 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Sample No. SS – 3: Water sample collected from Govt. Bore well inside 400 KVA GSS (RRVPNL), Village: Akal, Post: Jodha, District Jaisalmer

Parameter	**Concentration**	**Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010**		**Protocol (Test Method)**
		Desirable Limit	**Permissible Limit in absence of alternate source**	
1.1.1.1.3 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7.8 -1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	8.36	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	120.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.03 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	61.98 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	977.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	27.20 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	12.74 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	131.75 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	2.25 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	0.83 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	0.2 Mg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 - 1994
Anionic Detergents as MBAS	0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	204.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986

Aluminum as Al	0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
Bacteriological Characteristics				
Coliform Organisms	6 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Sample No. SS – 4: Water sample collected from Open Well of Babu Singh Champavat Village: Kakani, Post and Tehsil: Luni, District Jodhpur

Parameter	Concentration	Standard Drinking water Specification as per IS –10500:1991 as amendment up to 3 July 2010		Protocol (Test Method)
		Desirable Limit	Permissible Limit in absence of alternate source	
1.1.1.1.4 Essential Characteristics-Physical Parameter				
Color, Hazen Units	< 1	5	25	IS: 3025 Part 4 - 1983
Odour	Unobjectionable	Unobjectionable	-	IS: 3025 Part 5 - 1983
Taste	Agreeable	Agreeable	-	IS: 3025 Part 7,8 - 1984
Turbidity, NTU	< 1	5	10	IS: 3025 Part 10 - 1984
pH	8.30	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	108.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.02 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	7.99 Mg / L	250 Mg / L	1000 Mg / L	IS: 3025 Part 32 - 1988
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	IS: 3025 Part 26 - 1986
Desirable Characteristics-Chemical Parameters				
Dissolved Solids	181.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	33.60 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	5.88 Mg / L	30 Mg / L	100 Mg / L	IS: 3025 Part 46 - 1994
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	IS: 3025 Part 42 - 1992
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	IS: 3025 Part 59 - 2006
Sulphate as SO4	27.22 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	2.79 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	0.18 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	IS: 3025 Part 48 - 1994
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 41 - 1992
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	IS: 3025 Part 56 - 2003
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 37 - 1998
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 27 - 1986
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 47 - 1994
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	IS: 3025 Part 49 -

				1994
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	APHA 5540 C
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	IS: 3025 Part 52 - 2003
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	IS: 3025 Part 39 - 1991
Alkalinity	124.00 Mg / L	200 Mg / L	600 Mg / L	IS: 3025 Part 23 - 1986
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	IS: 3025 Part 55 - 2003
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	IS: 3025 Part 57 - 2005
Bacteriological Characteristics				
Coliform Organisms	3 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Annexure 4: Alstom Reply to RVPNL Letter dated 19.02.2016 regarding EMP issues

GE T&D India Limited
(formerly ALSTOM T&D India Limited)
L31102DL1957PLC193993

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Govt. Hostel Circle, Near Vishal Mega Mart
Ajmer Road, Jaipur-302 001, Rajasthan (India)

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F +91 141 2369508
www.alstomindiainvestorrelations.com

Ref: 5427PN066/RRVPNL/399
Date: 30th Aug-16

Superintending Engineer (Contracts-I)
Rajasthan Rajya Vidyut Prasaran Nigam Limited,
MM Building, Old Power House premises (Back side)
Near Ram Mandir, Bani park, Jaipur- 302006

Project: Establishing of 400/220kV, 3x500MVA Pooling Substation at Bhadla (Jodhpur) and Augmentation at existing 400kV GSS at Bikaner on turnkey basis (ICB No. RVPN /ADB/ Tranche-1/ICB-2)

Subject: Information of Environmental and Social aspects in various ADB funded Projects (ICB-2)

References:
1. RRVPNL Letter of Acceptance No. RVPN/SE (P&P)/XEN (ADB-I)/ICB-2/LOA/D.1240 dated 3rd November, 2014.
2. RRVPNL Letter No. RVPN / Sr.AO/PPM/ICB-2/F.2031(supply)/D. 744 Dated 04th December 2014
3. RRVPNL Letter No. RVPN / Sr.AO/PPM/ICB-2/F.2032(service)/D. 745 Dated 04th December 2014
4. RRVPNL letter no. No. RVPN/ SE (P&P)/ XEN(ADB-I)/ ICB-2 / D. 3086 Dt. 19.02.2016

Dear Sir,

This is with reference to the subject, environmental and social aspects are taken care at site. Compliance status of points mention in your letter given below:

1. Silent DG set is installed at site. - **Silent DG installed at site. Photograph attached.**

2. Water sprinkling on the areas where vehicles are moving inside the project area to avoid dust formation - **Water sprinkling and proper sand compaction done site.**

3. Gas is used by all your staff at site instead of fire wood. - **GAS Stove & Electrical Heater used at site. We are not using wood.**

4. Proper waste management from your kitchen and associated activities. - **Proper sanitation system made at site.**

5. Air, water, noise & soil parameters test reports are provided to the projects in charge as per the format provided by the visiting team. - **Report submitted at site.**

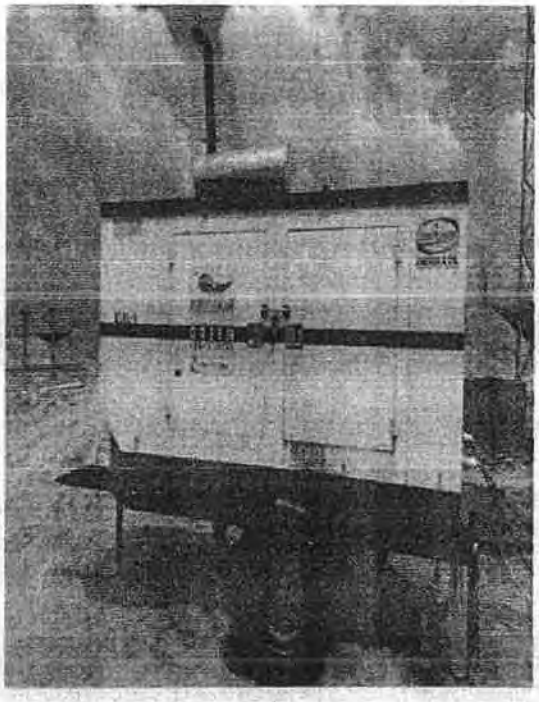
Hope above is in order.

Thanking you and assuring you of our best services as always.
Yours faithfully
For GE T&D India Limited
(Formerly ALSTOM T&D India Limited)

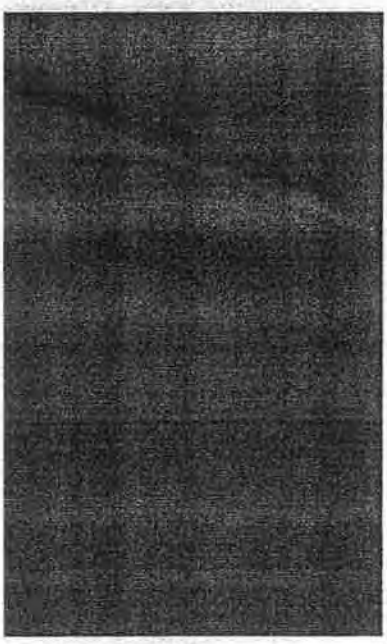
Vedprakash Vashistha
Branch Manager – Sales, Jaipur
Email ID – Vedprakash.vashistha@ge.com
Mob: 09799996548
CC: Chief Engineer- Contracts, Jaipur
Superintending Engineer- T&C, Bhadla

30/8/16

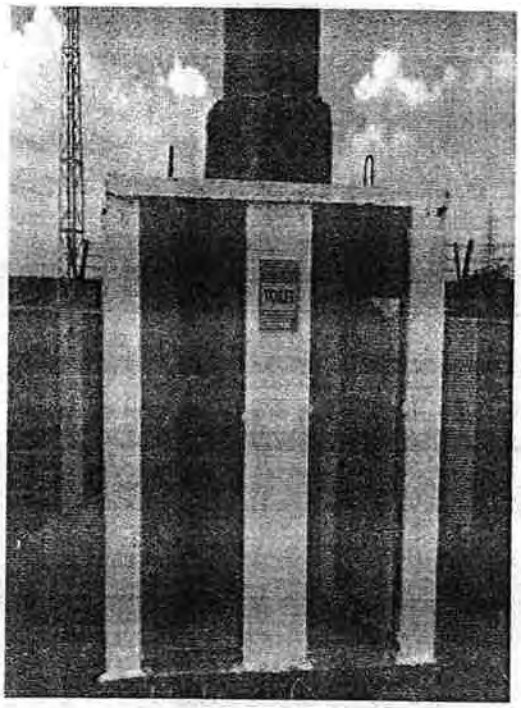
Silent DG Set Used at Site

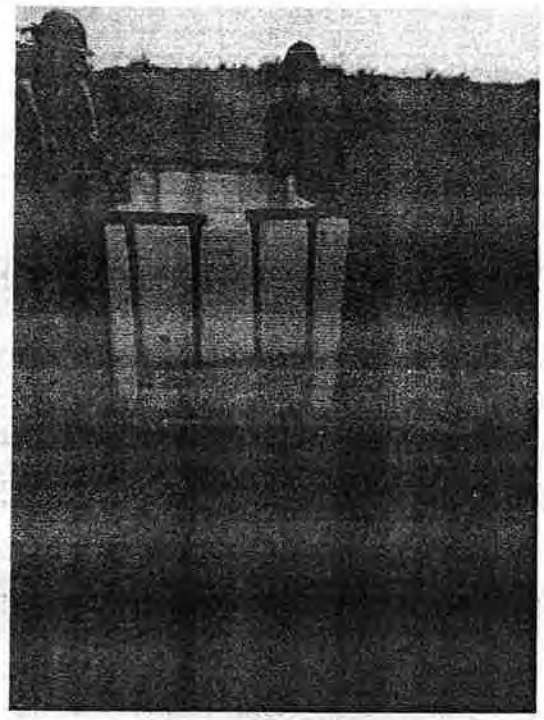


Water Sprinkling at Site

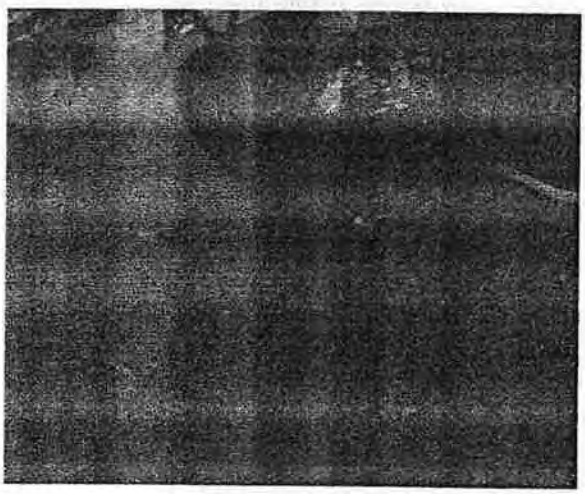


Sanitation System at Site





Gas Stove Used at Site



PROGRESS STATUS – ANNEXURE-05

Activity ID	Physical % Complete
400/220 KV 3 X 500 MVA POOLING SUBSTATION AT BHADLA	
INPUTS FROM CUSTOMER	
400/220kV switchyard plot plan CAD copy with coordinates : For BHADLA	100%
GA & Schematic drawings of Power Transformer & Bus reactor, NGR supplied by RRVPNL : For BHADLA	100%
Existing / RRVPNL scope 220/132/33KV end CRP &Busbar protection drawing : For BHADLA	100%
Existing Control Room Panel arrangement & ACK Layout : For BHADLA	100%
Remote end PLCC Make & drawing for the LILO line : For BHADLA	100%
All Transformer & Reactor Foundation Layout & Loading details Supplied by RRVPNL : BHADLA	100%
Line parameters,frequency, EPAX Scheme & details for outdoor equipment of other site for PLCC	0%
Relay Setting Inputs : Bhadla	0%
ENGINEERING	
ELECTRICAL	
ARRANGEMEN T LAYOUTS, OUTDOOR TYPE	100%
BUILDINGS, SWITCHGEARS INDOOR TYPE LAYOUTS	100%
ENGINEERING CALCULATIONS, PRIMARY ENGINEERING	100%
CABLING LAYOUTS	100%
EARTHING NETWORK DRAWINGS	100%
INSTALLATION DRAWINGS	100%
SINGLE LINE DIAGRAMS	100%
AC, DC AUX SERVICES SLD	100%
SCHEDULE (POWER)	95%
ENGINEERING CALCULATIONS, SECONDARY ENGG	90%
CIVIL	
PRELIMINARY	100%
LAYOUTS	100%
ARCHITECTURAL DRAWINGS - Control Room Building, Bay level Kiosk Building, Fire fighting Pump House	100%
DESIGN CALCULATIONS - 400 KV STRUCTURE	100%
DESIGN CALCULATIONS - 220 KV AND OTHER STRUCTURE	100%
FOUNDATION ENGINEERING - 400 KV STRUCTURES	100%
FOUNDATION ENGINEERING - 220 KV AND OTHER STRUCTURES	100%
OTHER MISC. DESIGNS	100%
CONTROL ROOM BUILDING	100%
BAY LEVEL KIOSK BUILDING	100%
FIRE FIGHTING PUMP HOUSE BUILDING	100%

STEEL STRUCTURAL - 400 KV FABRICATION DRAWINGS	100%
STEEL STRUCTURAL - 220 KV FABRICATION DRAWINGS	100%
FOUNDATION DRAWINGS FOR YARD - 400 KV	100%
FOUNDATION DRAWINGS FOR YARD - 220 KV	100%
OTHER MISCELLANEOUS DRAWINGS	80%
SUPPLY	
33/.433 kV, 800 kVA, 250 kV BIL LT THREE PHASE TRANSFORMER	100%
33/.433 kV, 630 kVA, 170 kV BIL LT THREE PHASE TRANSFORMER	100%
420 KV CIRCUIT BREAKER	66%
245 KV CIRCUIT BREAKER	100%
420 KV CT	100%
245 KV CT	80%
420 KV CVT	100%
245 KV CVT	100%
36 KV, 52 KV EMVT	100%
420 KV ISOLATOR	100%
245 KV ISOLATOR	100%
72.5 KV ISOLATOR	100%
390 KV LA	100%
198 KV LA	100%
120 KV LA FOR REACTOR	100%
42 KV LA	100%
400 KV WAVE TRAP	100%
220 KV WAVE TRAP	100%
400 KV CONTROL, RELAY & PROTECTION PANEL	100%
220 KV CONTROL, RELAY & PROTECTION PANEL	100%
SUBSTATION AUTOMATION SYSTEM	96%
PLCC	40%
BATTERY	100%
BATTERY CHARGER	100%
400 KV BPI	100%
220 KV BPI	100%
LT SWITCHGEAR	50%
400 KV HRDWARE	100%
220 KV HRDWARE	100%
DISC INSULATORS / LONG ROD	100%
40 MM DIA MS ROD	100%
ALUMINIUM TUBE	80%
400 KV CLAMPS & CONNECTORS	25%
220 KV CLAMPS & CONNECTORS	25%
LUGS & GLANDS	25%
POWER CABLE	25%
CONTROL CABLE	25%
ACSR MOOSE CONDUCTOR	100%

ACSR TARANTULLA CONDUCTOR	100%
EARTHING MATERIALS / ELECTRODES ETC.	100%
ILLUMINATION MATERIALS	75%
FIRE FIGHTING SYSTEM	20%
AIR-CONDITIONING AND VENTILATION SYSTEM	20%
400 KV LATTICE STRUCTURE	100%
220 KV LATTICE STRUCTURE	100%
400 KV PIPE STRUCTURES	80%
220 KV PIPE STRUCTURES	100%
FOUNDATION BOLTS	100%
TOOLS & TACKLES	20%
OIL FILTER MACHINE	100%
MOBILE CRANE	50%
TESTING & MEASURING KIT	50%
FURNITURE FOR CONTROL ROOM	50%
CONSTRUCTION	
BADHALA	
CIVIL WORKS	
Site Preparation	100%
Temporary Site Office for Owner	100%
TOWER FOUNDATIONS	100%
EQUIPMENTS FOUNDATIONS	96%
TRANSFORMER FOUNDATIONS	50%
CONTROL ROOM BUILDING	75%
BAY LEVEL KIOSK BUILDING	80%
FIRE FIGHTING PUMP HOUSE BUILDING	25%
CABLE TRENCH	65%
OTHER CIVIL WORKS (Road, Drain, Yard PCC etc)	50%
ERECTION / INSTALLATION	
400 KV TOWER ERECTION & STRINGING WORKS	100%
220 KV TOWER ERECTION & STRINGING WORKS	100%
ERECTION OF 400 KV EQUIPMENT SUPPORT STRUCTURE & EQUIPMENTS	40%
ERECTION OF 220 KV EQUIPMENT SUPPORT STRUCTURE & EQUIPMENTS	80%
ERECTION OF CONTROL ROOM EQUIPMENTS	0%
ERECTION OF PANELS IN BAY KIOSK ROOM	0%
ERECTION IN FIRE FIGHTING BUILDING	0%
ERECTION OF OTHER EQUIPMENTS	0%
ERECTION OF TRANSFORMERS & REACTORS	0%
CABLING WORKS	0%
EARTHING WORKS	65%
TESTING & COMMISSIONING	**0%**

Annexure-06

GRID
JAIPUR
India

ALSTOM

ALSTOM T&D India Limited,
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Ref: 5427PN068/RRVPNL/120
Date: 25th June 2015

Superintending Engineer (P&P),
Rajasthan Rajya Vidyut Prasaran Nigam Limited,
Vidyut Bhawan, Jyoti Nagar, Jaipur- 302005

Project: Establishing of 400/220kV, 3x500MVA Pooling Substation at Bhadla (Jodhpur) and Augmentation at existing 400kV GSS at Bikaner on turnkey basis.

Subject: Contractor mobilization for civil work and Bhoomi Poojan at Bhadla Site

Reference:

1. RRVPNL Letter of Acceptance No. RVPN/SE (P&P)/XEN (ADB)/ACS-2/LOA/D.1240 dated 3rd November, 2014.
2. RRVPNL Letter No. RVPN / Sr.AO/PPM/ICB-2/F.2031(supply)/D. 744 Dated 04th December 2014
3. RRVPNL Letter No. RVPN / Sr.AO/PPM/ICB-2/F.2032(service)/D. 745 Dated 04th December 2014

Dear Sir,

With reference to above cited subject, we would like to inform that contactor mobilization for civil work and Bhoomi Poojan is planned on 1st July 2015 followed by Site kick off meeting for discussion on work schedule.

We hereby solicit your kind presence and cooperation.

Thanking & assuring of our best services at all times.

Yours faithfully
For ALSTOM T&D India Limited

Vedprakash Vashistha
Branch Manager – Sales,Jaipur
Email ID – Vedprakash.vashistha@alstom.com
Mob: - 09799696548

Cc: The Director (Technical), RVPN, Jaipur
The Chief Engineer (PPM), RVPN, Jaipur
The Zonal Chief Engineer (T&C), RVPN Jodhpur.
The Zonal Chief Engineer (Civil), RVPN Jodhpur
The Superintending Engineer (P&P), RVPN, Jaipur
The Superintending Engineer (400kV GSS, Bhadla)