Environmental Monitoring Report

Project Number: 45224-003
April 2017

Period: April 2016 – September 2016

IND: Rajasthan Renewable Energy Transmission Investment Program - Tranche 1

Subprojects: 400 kV Pooling Substation Bhadla & augmentation works at Bikaner GSS (ICB-2)

Submitted by

Rajasthan Rajya Vidyut Prasaran Nigam Limited, Jaipur

Asian Development Bank

GM/VRK

Envionmental monitoring report
TA.CE.CONTRACTS@RVPN.CO.IN
to:
gmahajan@adb.org
31/03/2017 04:24 PM
Hide Details
From: "TA.CE.CONTRACTS@RVPN.CO.IN" <TA.CE.CONTRACTS@RVPN.CO.IN>
To: "gmahajan@adb.org" <gmahajan@adb.org>
History: This message has been forwarded.

1 Attachment

2.ICB-2 First Envionment Monitoring Report-Bhadla GSS Apr 2016- Sep'16.docx

Regards,

J.P.Ramawat
TA to ACE (Contracts),
RVPN, Jaipur
Mobile : +91-9413345569

Soft copy rcvd 31.03.17

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 – April 2016-Sep 2016.
Reporting – Oct -2016.

India: Rajasthan Renewable Energy Transmission Investment Program

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

Environment Monitoring Report

Compliance Status & Monitoring Report of Environment Safeguards

Period: April 2016 – Sep 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)	April -2016 to Sep-2016
IV	Report No.	2
V	Report for the period	April -2016 to Sep-2016
VI	Date of reporting	Oct-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	99%	18.03.15 to continue (Document detail Enclosed)
2	Civil work	70%	01.07.15 to Continue (Document detail Enclosed)
3	Supply order	90%	01.10.15 to Continue (Document detail Enclosed)
4	Erection	63%	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	Not applicable since site is in desert area location
2	The Air (Prevention and Control of Pollution) Act, 1981	Air Pollution	Preventive measures are being adopted to avoid such pollution. Report attached at annexure-07.
3	The Environment (Protection) Act, 1986	Construction Practices	Not applicable since site is in desert area location
4	The Environment Impact Assessment Notification, 1994 as amended	EMP monitoring	EMP format filled up & test reports attached at Annexure-07
5	The Hazardous Wastes (Management and Handling) Rules, 1989 as amended	Transformer Oil	Not applicable at this Stage Dry Plate shall be used alongwith full proof electromechanical mechanism during filling of Transformer oil by competenent person.
6	The Ozone Depleting Substances (Regulation and Control) Rules, 2000	Cleaning of electrical contacts using HFCs etc.	Not applicableat this stage. Shall be taken care during filling of SF6 Gas in Breaker through full prood mechanism handled by competent person
7	The Batteries (Management and Handling) Rules, 2001 as amended	Batteries	Not applicable since dry type battery used
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.

SNo.	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	Reports attached at Annexure-07.

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	One at -site	One Safety Officer

	environment safeguards		
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/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.	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		Reports attached at annexure-07			
	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		Reports attached at annexure-07			
	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		Reports attached at annexure-07			
	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		NA			
	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)
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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 6	AN - 1	Near Munna Ram's tube well
			AN – 2	Near Sarpanch (Mathar Khan's House) Churon Ki Basti
			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	Arniya 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	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: 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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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.II)/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. 3088 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 Biilding, 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,
910, 9th floor, Okay Plus Tower
Govt. Hostel Circle, Near Vishal Mega Mart
Ajmer Road, Jaipur -302 001, Rajasthan (India)
Tel : +91 141 2369509, 2363510
Fax : +91 141 2369508
www.alstom.com

Ref: 5427PN068/RRVPNL/120
Date: 28th 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.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

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: - 09799996548

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)

Annexure -07

Air ,Noise and water test reports

Regd. No.: 080152100218

MONI'S GROSAM ENGINEERING DESIGN & RESEARCH CONSULTANCY

An ISO 9001 : 2008 Certified Company

B-39, Industrial Estate, New Power House Road, JODHPUR - 342 003 (Raj.)
Telefax : 0291-2633401 • Mob. 94141-33401 • E-mail : guru_moni20@yahoo.com
Website : www.monisengineering.com

JAS-ANZ RQ91/6237 I C S

M/s. GE T & D India Ltd,
400 KV, GSS RR VPNL
Bhadala
BAP

ISO Reg. No.
RQ 91/6237

Sample Report No		MGED&RC/16-17/AM/0031		
Sample Drawn by	Environment	Sample received on	05.10.2016	
Sampling Procedure		As per IS/APHA/EPA Guideline		
Monitoring for		Ambient Air Monitoring		
Sampling Location		Cement Go down		
Lateral Distance		2.0 meter from G.L		
Duration		30 minutes		
Time		4.10 PM to 4.40 PM		
Limits		National Ambient Air Quality Standards (NAAQS) for GSR 826 (E)		

Parameters	DG	**Limits**	**Units**	**Method**
General Parameters				
Sulphur dioxide (SO_2)	25.15	Max.80	µg/m³	IS 5182 (Part 2):2001,RA 2006
Nitrogen Dioxide (NO_2)	27.10	Max.80	µg/m³	IS 5182 (Part 2):1973,RA 2009
Respirable Suspended Particulates Matter (PM_{10})	70.18	Max.100	µg/m³	IS 5182 (Part 23):2006
Particulates Matter ($PM_{2.5}$)	40.10	Max.60	µg/m³	US EPA CFR 40 Part 50 Appendix I
Carbon Monoxide (CO)	<0.5	Max 2	µg/m³	IS 5182 (Part 10):1999,RA ,RA 2009

This report is issued without prejudice and purely based on observations at the time of test.

NOTE : -1. This certificate is valid for One year
2. Due date of inspection 04.10.2017

(Er. G.D. BISSA)
Competent Person under Factory Act.

Regd. No.: 080152100218

MONI'S GROSAM ENGINEERING DESIGN & RESEARCH CONSULTANCY

An ISO 9001 : 2008 Certified Company

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Website : www.monisengineering.com

JAS-ANZ RQ91/6237 ICS

M/s. GE T & D India Ltd,
400 KV, GSS RR VPNL
Bhadala
BAP

ISO Reg. No.
RQ 91/6237

Sample Report No			MGED&RC/16-17/AM/0030		
Sample Drawn by	Environment		Sample received on	05.10.2016	
Sampling Procedure			As per IS/APHA/EPA Guideline		
Monitoring for			Ambient Air Monitoring		
Sampling Location			Control Room Building		
Lateral Distance			2.0 meter from G.L		
Duration			30 minutes		
Time			2.45 PM to 3.15 PM		
Limits			National Ambient Air Quality Standards (NAAQS) for GSR 826 (E)		
Parameters	**DG**		**Limits**	**Units**	**Method**
General Parameters					
Sulphur dioxide (SO_2)	24.15		Max.80	µg/m³	IS 5182 (Part 2):2001,RA 2006
Nitrogen Dioxide (NO_2)	26.8		Max.80	µg/m³	IS 5182 (Part 2):1973,RA 2009
Respirable Suspended Particulates Matter (PM_{10})	69.80		Max.100	µg/m³	IS 5182 (Part 23):2006
Particulates Matter ($PM_{2.5}$)	40.10		Max.60	µg/m³	US EPA CFR 40 Part 50 Appendix I
Carbon Monoxide (CO)	<0.5		Max.2	µg/m³	IS 5182 (Part 10):1999,RA ,RA 2009

This report is issued without prejudice and purely based on observations at the time of test.

NOTE : -1. This certificate is valid for One year
2. Due date of inspection 04.10.2017

G.D. BISSA Competent Person Under Factory Act

(Er. G.D. BISSA)
Competent Person under Factory Act.

Lic. No.

Regd. No.: 080152100218

MONI'S GROSAM ENGINEERING DESIGN & RESEARCH CONSULTANCY

An ISO 9001 : 2008 Certified Company

B-39, Industrial Estate, New Power House Road, JODHPUR - 342 003 (Raj.)
Telefax : 0291-2633401 • Mob. 94141-33401 • E-mail : guru_moni20@yahoo.com
Website : www.monisengineering.com

JAS-ANZ RQ91/6237 ICS

M/s. GE T & D India Ltd,
400 KV, GSS RR VPNL
Bhadala
BAP

ISO Reg. No.
RQ 91/6237

Sample Report No			MGED&RC/16-17/AM/0029		
Sample Drawn by	Environment		Sample received on	05.10.2016	
Sampling Procedure			As per IS/APHA/EPA Guideline		
Monitoring for			Ambient Air Monitoring		
Sampling Location			Bleaching Plant		
Lateral Distance			2.0 meter from G.L		
Duration			30 minutes		
Time			2.0 PM to 2.30 PM		
Limits			National Ambient Air Quality Standards (NAAQS) for GSR 826 (E)		
Parameters	DG		**Limits**	**Units**	**Method**
General Parameters					
Sulphur dioxide (SO_2)	26.17		Max.80	µg/m³	IS 5182 (Part 2):2001,RA 2006
Nitrogen Dioxide (NO_2)	28.7		Max.80	µg/m³	IS 5182 (Part 2):1973,RA 2009
Respirable Suspended Particulates Matter (PM_{10})	71.80		Max.100	µg/m³	IS 5182 (Part 23):2006
Particulates Matter ($PM_{2.5}$)	43.10		Max.60	µg/m³	US EPA CFR 40 Part 50 Appendix I
Carbon Monoxide (CO)	<0.5		Max.2	µg/m³	IS 5182 (Part 10):1999,RA ,RA 2009

This report is issued without prejudice and purely based on observations at the time of test.

NOTE : -1. This certificate is valid for One year
2. Due date of inspection 20.07.2016

(Er. G.D. BISSA)
Competent Person under Factory Act.

Lic. No.

Regd. No.: 080152100218

MONI'S GROSAM ENGINEERING DESIGN & RESEARCH CONSULTANCY

An ISO 9001 : 2008 Certified Company

B-39, Industrial Estate, New Power House Road, JODHPUR - 342 003 (Raj.)
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Website : www.monisengineering.com

JAS-ANZ RQ91/6237 ICS

M/s. GE T & D India Ltd,
400 KV, GSS RR VPNL
Bhadala
BAP

ISO Reg. No.
RQ 91/6237

Sample Report No	MGED&RC/16-17/AM/0031		
Sample Drawn by	Environment	Sample received on	05.10.2016
Sampling Procedure	As per IS/APHA/EPA Guideline		
Monitoring for	Ambient Air Monitoring		
Sampling Location	D.G. Room (Near Cement Godown)		
Lateral Distance	2.0 meter from G.L		
Duration	30 minutes		
Time	4.10 PM to 4.40 PM		
Limits	National Ambient Air Quality Standards (NAAQS) for GSR 826 (E)		

Parameters	DG	Limits	Units	Method
General Parameters				
Sulphur dioxide (SO_2)	25.15	Max.80	µg/m³	IS 5182 (Part 2):2001,RA 2006
Nitrogen Dioxide (NO_2)	27.10	Max.80	µg/m³	IS 5182 (Part 2):1973,RA 2009
Respirable Suspended Particulates Matter (PM_{10})	70.18	Max.100	µg/m³	IS 5182 (Part 23):2006
Particulates Matter ($PM_{2.5}$)	40.10	Max.60	µg/m³	US EPA CFR 40 Part 50 Appendix I
Carbon Monoxide (CO)	<0.5	Max.2	µg/m³	IS 5182 (Part 10):1999,RA ,RA 2009

This report is issued without prejudice and purely based on observations at the time of test.

NOTE : -1. This certificate is valid for One year
2. Due date of inspection 04.10.2017

(Er. G.D. BISSA)
Competent Person under Factory Act.

Lic. No.
2/PA/DYCIF&B/16

Regd. No.: 080152100218

MONI'S GROSAM ENGINEERING DESIGN & RESEARCH CONSULTANCY

An ISO 9001 : 2008 Certified Company

B-39, Industrial Estate, New Power House Road, JODHPUR - 342 003 (Raj.)
Telefax : 0291-2633401 • Mob. 94141-33401 • E-mail : guru_moni20@yahoo.com
Website : www.monisengineering.com

JAS-ANZ RQ91/6237 ICS

REF: MGED&RC/F&B/Noise-16/0027

ISO Reg. No. RQ 91/6237

DATE: 05.10.2016

M/s. GE T & D India Ltd,
400 KV, GSS RR VPNL.
Bhadala
BAP

Sub.: Inspection as per Factory Act.

Dear Sir,

As per Factory Act 1948 and the Air Prevention Act 1981. The following readings were found:

Ambient noise due to D.G. Set

D.G. Set
Location : 220 KV Yard

Distance	Day time	End Time
(0.5 meters)	68.0 dB	49.9 dB
(2 meters)	51.1 dB	42.3 dB
(4 meters)	39.0 dB	36.7 dB

Machine status: Sound Level Meter Make Lupton, Model: SL-4001, Sr. No: G 12413 internal calibration.

The sound level observed is up to mark w.r.t the norms laid in act / official gazette.

G.D. BISSA JODHPUR Competent Under Factory Act

(Er. G.D. BISSA)
Competent Person under Factory Act.

Lic. No.
2/PA/DYCIF&B/16

Regd. No.: 080152100218

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JAS-ANZ RQ91/6237 ICS

REF: MGED&RC/F&B/Noise-16/0026

ISO Reg. No. RQ 91/6237

DATE: 05.10.2016

M/s. GE T & D India Ltd,
400 KV, GSS RR VPNL
Bhadala
BAP

Sub.: Inspection as per Factory Act.

Dear Sir,

As per Factory Act 1948 and the Air Prevention Act 1981. The following readings were found:

Ambient noise due to D.G. Set

D.G. Set
Location : Bikaner Dia-2 Near ACK-2

Distance	Day time	End Time
(0.5 meters)	69.1 dB	58.2 dB
(2 meters)	59.5 dB	48.7 dB
(4 meters)	36.3 dB	34.3 dB

Machine status: Sound Level Meter Make Lupton, Model: SL-4001, Sr. No: G 12413 internal calibration.

The sound level observed is up to mark w.r.t the norms laid in act / official gazette.

G.D. BISSA JODHPUR Examiner Under Factory Act Competent Person

(Er. G.D. BISSA)
Competent Person under Factory Act.

Lic. No.
2/PA/DYCIF&B/16

Regd. No.: 080152100218

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JAS-ANZ RQ91/6237 ICS

REF: MGED&RC/F&B/Noise-16/0025

ISO Reg. No. RQ 91/6237

DATE: 05.10.2016

M/s. GE T & D India Ltd,
400 KV, GSS RR VPNL
Bhadala
BAP

Sub.: Inspection as per Factory Act.

Dear Sir,

As per Factory Act 1948 and the Air Prevention Act 1981. The following readings were found:

Ambient noise due to D.G. Set

D.G. Set
Location : Bikaner Dia-2 Near ACK-2

Distance	Day time	End Time
(0.5 meters)	69.2 dB	58.4 dB
(2 meters)	60.5 dB	48.2 dB
(4 meters)	40.3 dB	34.3 dB

Machine status: Sound Level Meter Make Lupton, Model: SL-4001, Sr. No: G 12413 internal calibration.

The sound level observed is up to mark w.r.t the norms laid in act / official gazette.

G.D. BISSA JODHPUR Examiner Under Factory Act Competent Engineer

(Er. G.D. BISSA)
Competent Person under Factory Act.
Lic. No.
2/PA/DYCIF&B/16

MONI'S GROSAM ENGINEERING LAB

An ISO 9001 : 2008 Certified Lab

B-39, INDUSTRIAL ESTATE, NEW POWER HOUSE ROAD, JODHPUR - 342 003 (Raj.)

Tel.: 0291 - 2433910, Mobile : 94141 28695, 94144 77835

E-mail : monis_lab54@yahoo.com • Website : www.monislab.com

Testing Facilities Available in House :

Aggregate, Bitumen, Cement, Water, Soil, Steel, Cube, Bricks, Stone, Calibration of Equipments & All Engineering Items

TEST REPORT

REPORT No.-MGEL/TR/WTR/01733	**Date: 10/09/16**	**Test Data Sheet No.MG/RE**
Test Report as per IS Code: 456, 3025		**Amendment No(s)----------**
NAME & ADDRESS OF PARTY: **M/S ALSTOM T & D INDIA LTD. BHADLA**	Location Of Site: AS PER LETTER Ref: RRVPNL/ALSTOM/BHADLA/BHADLA-W-OX DATED: 03.SEP.2016 WORK:- 400/220 KV S/S BHADLA	

PART I. Particulars of sample submitted.

a) Nature of Sample	WATER
b) Grade/Variety/Type/Class/Size etc	WATER
c) Brand name, if any	WATER;
d) Declared values, if any	NIL
e) Code No.	MGEL/TR/WTR/01733
f) Source.	**1. RO WATER FOR DRINKING PURPOSE** **2. CANAL WATER RCC BLOCK A/C 400/200 KV S/S BHADLA**
g) Quantity	ONE LITRE
h) Mode of Packing	IN BOTTLE
i) Date of Receipt	03.SEP.2016
j) Seal	INTACT/NOT INTACT/ NOT SEALED
m) IO's signature	Signed/Unsigned
n) Any other Information	NIL

NOTES

1. *This report, in full or in part, shall not be published, advertised, used for any legal action, unless prior permission has been secured from the Head of the Laboratory, Monis Grosam Engg. Lab., Jodhpur.*
2. *This test report is only for the given sample tested.*
3. *All matters related to Jodhpur Jurisdiction only.*

GROSAM ENGG. LAB JODHPUR

PART V. Supplementary information's.

REPORT NO: MGEL/TR/WTR/01733	IS Code: 456, 3025	DATED: 10/09/16
a) Reference to sampling procedure, wherever applicable	Sample submitted by the party;	

PART VI. TEST RESULTS

SL. NO.	TESTS/ CL.REF	REQUIREMENTS	DESIRABLE LIMIT	PERMISSABLE LIMIT IN THE ABSENSE OF ALTERNATE SOURCE	RESULTS OBTAINED
1)	WATER RO WATER FOR DRINKING PURPOSE	a) pH Value	6.5 TO 8.5	NO RELAXATION	**7.2**
		b) Chlorides	250 mg/lit	1000 mg/lit	**39 mg/lit.**
		c) Sulphate	200 mg/lit	400 mg/lit	**29.52 mg/lit.**
		d) Total Hardness	300 mg/lit	600 mg/lit	**102 mg/lit**
		e) Total Dissolved Solids (T D S)	500 mg/lit	2000 mg/lit	**211 mg/lit**
		f) Fluorides	1.0 mg/lit	1.5 mg/lit	**NIL**
		g) Nitrate	45.0 mg/lit	100.0 mg/lit	**2.0 mg/lit**
		h) Alkalinity	200.0 mg/lit	600.0 mg/lit	**91 mg/lit**
		i) Turbidity	5 NTU	10 NTU	**0.2 NTU**
		j) Ca.H	75.0 mg/lit	200.0 mg/lit	**89 mg/lit**
		k) Mg.H	30.0 mg/lit	100.0 mg/lit	**15 mg/lit**

PART VII – Remarks: ABOVE WATER IS SUITABLE FOR DRINKING POURPOSE.

Report No. MGEL/TR/WTR/01733 **IS: 456, 3025** **Date: 10/09/16**

MANAGER

CIVIL ENGG

For MONI'S GROSAM ENGG. LAB.

AUTHORISED SIGNATORY

MONI'S GROSAM ENGG. LAB. Asstt. Manager (C&A) JODHPUR