Environmental Monitoring Report

Project Number: 45224-003
April 2017

Period: April 2016 – October 2016

IND: Rajasthan Renewable Energy Transmission Investment Program - Tranche 1

Subprojects: 400 kv D/C LILO of Jodhpur – Merta Transmission Line to Bhadla (ICB-6)

Submitted by

Rajasthan Rajya Vidyut Prasaran Nigam Limited, Jaipur

Asian Development Bank

RUS

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NK/NRK.

From: "TA.CE.CONTRACTS@RVPN.CO.IN" <TA.CE.CONTRACTS@RVPN.CO.IN>
To: "pmishra@adb.org" <pmishra@adb.org>
Date: 03/14/2017 10:15 AM
Subject: Fw: Environment & social monitoring report ICB-06 (200 Kms) Apr16 to Oct 16-Mail 2/2

kfa

Regards,

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

From: Rita Singh
Sent: 10 March 2017 18:47
To: 'TA.CE.CONTRACTS@RVPN.CO.IN'
Cc: Abhishek Srivastava
Subject: Environment & social monitoring report ICB-06 (200 Kms) Apr16 to Oct 16-Mail1/2

Sir,
Pl find attached herewith Social & Environment monitoring report of ICB-06 for 200 Kms from Apr16 to Oct 16.

With Best Regards,

Rita Singh
Senior Manager (Projects)
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.gov.in and click "SSO Sign-in".

Environment Monitoring Report- 400 kV DC Bhadla to Jodhpur ICB 6 - 200kms April- 2016 to Oct -16.doc

Environmental Safeguards Document

Environment Monitoring Report

400 kv D/C LILO of Jodhpur – Merta Transmission Line to Bhadla (ICB-6)

Project Number: 45224 (IND)

Period – April 16 – October 16.

Reporting - 21 November 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: April 2016 – October 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

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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/New Power House , Jodhpur – 342003
III	Monitoring Period (Season/month)	April' 2016 to October'2016
IV	Report No.	03
V	Report for the period	April' 2016 to October'2016
VI	Date of reporting	21 November, 2016

A.2. Subproject details

	List of sub-projects	**Name of the Project site**
I	**400 KV D/C Bhadla to Jodhpur Transmission Line. (ICB 6)- 160 Kms**	**400kV D/C TWIN ACSR Moose Transmission Line from BHADLA (Jaisalmer) to JODHPUR -MERTA LILO POINT under specification No. RRVPN / ADB / Tranche 1/ICB-6 (Supply & Service contract) to M/s Tata Projects Ltd.**

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

S No	**Name of sub-project**	**Progress as on date of Report**	**Implementation Schedule**
1	**Detailed Survey including Check survey**	199.221 Kms	100% completed
2	**Foundation including backfilling**	493 Nos	54 Balance. 90 % completed. Balance to be completed by Mar'2017
3	**Erection**	397 Nos	150 Balance. 73 % completed. Balance to be completed by Apr'2017
4	**Stringing**	43.161 Kms	156.06 Kms Balance. Balance shall be completed by September'2017

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	All type of preventive measures are being adopted to avoid such pollution. Agency Finalized, testing under progress, Report shall be submitted by Nov'2016 end.
2	The Air (Prevention and Control of Pollution) Act, 1981	Air Pollution	All type of preventive measures are being adopted to avoid such pollution. Agency Finalized, testing under progress, Report shall be submitted by Nov'2016 end.
3	The Environment (Protection) Act, 1986	Construction Practices	Agency Finalized, testing under progress, Report shall be submitted by Nov'2016 end.
4	The Environment Impact Assessment Notification, 1994 as amended	EMP monitoring	Agency Finalized, testing under progress, Report shall be submitted by Nov'2016 end.
5	The Hazardous Wastes (Management and Handling) Rules, 1989 as amended	Transformer Oil	Not applicable
6	The Ozone Depleting Substances (Regulation and Control) Rules, 2000	Cleaning of electrical contacts using HFCs etc.	Not applicable
7	The Batteries (Management and Handling) Rules, 2001 as amended	Batteries	Not applicable
8	The Indian Forest Act, 1927 as amended	Reserve Forest areas, Right of way	Forest Land is not involved; we have avoided the forest area in complete Line. Line is more than 1.0 Kms away from Forest Land.
9	The Wild Life (Protection) Act, 1972 as amended	Critical habitats	Line has been selected in a manner to avoid wild life. Line is more than 4-5 Kms away from Forest Land.
10	The Biological Diversity Act, 2002	Wetland	No Wetland is involved.
11	The Forest (Conservation) Act, 1980 as amended	Construction work in forest areas	No Forest Land is Involved; we have avoided the forest area in complete Line. Line is more than 1.0 Kms away from Forest

			Land.
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 is disbursed 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	23 Mtr either side of the central line, corridor width 46 mtrs, as per approved RVPNL tower schedule.
2	Clearance from trees	8.840 Kms, as per approved RVPNL tower schedule.
3	Forest area and Nos. of trees.	No Forest land is being involved. No trees being affected during the Foundation and erection work. During the stringing work no trees shall be cut, only trimming of branches shall be done.
4	Damage to forest	No damage shall be done to forest area.
5	Wild life sanctuaries	No Wild life is involved in Project. Line is more than 4-5 Kms away from Forest Land.

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	All damaged Crops are compensated as per the norms of RVPNL/State Revenue Department.
2	Compensation for land damages	As per EPC contractor bid	During Line construction Land is not being damaged.
3	Compensation for pathways, channels for waterway.	Restoration after erection by EPC contractor	As on date, all preventive practices were followed to avoid affecting such ways. 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. No reported dust, noise, vibrations, and labor problems.

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, airports have been affected Proposal for the obtaining Clearance

SNo.	Product Activity/Stage	Parameter to be monitored	Compliance Status
			from Railway line crossing has been submitted and measures are adopted to avoid any disturbance in railway Tracks.
3	Safeguard against critically endangered Flora and fauna.	Avoid	We have strictly avoided the Flora and Fauna.
4	Rain and Flood prone area.	Avoid	We have avoided the Flood zone area in the entire transmission line.
5	Environmental parameters for air, noise, land and water during project construction	Environmental Monitoring Plan	Agency Finalized, testing under progress, Report shall be submitted by Nov'2016 end.

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.	03 safety Officers have been deputed for the safeguard of enviroment.
2	PIU established as per proposed institutional mechanism	Date	05.05.2015
3	GRC formation	Date	30.10.2015
4	Grievance Redress Mechanism followed	Proper record	No Tree cutting involved, Currently no environment related grievances received.

B.2.6. Other measures:

I	Sub-Project #
1	Good quality water is being provided for drinking, cooking and bathing purpose.
2	Safety Induction programs are being conducted for the role of safety in Transmission line.
3	Quality improvement initiatives are adopted for the betterment of individual and work.
4	100 Nos of Trees have been planted store area-Osian and Phalodi.
5	Blood Donation camp was done at the Government Hospital, Osian.
6	Colour code used for the separation of usable and damage Tool and Plants.

B2.8 Annexures

I	Sub-Project #
1	Photographs of the following – Laying of earthing, Foundation work, Stringing work, drinking water World's Quality Day celebration, training session for HSE, flora fauna etc.
2.	RVPNL Letter dated 02.11.2016 regarding submission of EMP report
3.	Baseline Report of Environmental Parameters (Pre-construction)
4.	Tata Projects Limited Reply to RVPNL Letter dated 21.11.2016 regarding EMP report submission.

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	Route has been selected in a manner to avoid the interference of such amenities.	493	Excess soil after foundation kept on bund of field, same is regular practice at site.	Need to mainta in up to compl etion of project	RRVPNL
Substation location and design	Noise generation Exposure to noise, Nuisance to neighboring properties	Substation designed to ensure noise will not be a nuisance.	Expected noise emissions based on substation design, noise levels	Not Applicable				
	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					

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
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	Tower Locations have been selected to avoid the overhead crossing of households/dwellings. Line is minimum 500 Mtr away from such dwelling area.	199.221KM	46 Mtr corridors from center of tower is maintained during survey work to avoid houses &for 500 mtr for water reserve.	Need to maintain up to completion of project.	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 Line.	493 Nos	46 Mtr corridor from center of tower is maintained during survey work to avoid houses & for 500 mtr for water reserve	Need to maintain up to completion of project.	RRVPNL
Equipment specifications and design parameters	Release of chemicals and harmful gases in receptors (air, water, land)	PCBs free substation transformers or other project facilities or equipment.	Transformers and specifications and compliance with setback distances (“as-built” diagrams)	Not Applicable				
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	Route has been selected in a manner to avoid such encroachments. No ecological area is been involved		Entire line passing away from flora & funa / forest area/ NOC had taken before starting of project.	Non	RRVPNL
Involuntary resettlement or land acquisition	Loss of lands and structures	Compensation paid for temporary/ permanent loss of productive land	Public complaints	No land is damaged during the construction of TL. Compensation	.	Land Acquisition not done in project for carrying out the work.	Crop compensationonly paid to affected land	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
				shall be paid for the cultivated crop damaged			owners	
Encroachment into farmland	Loss of agricultural productivity	Use existing tower footings/towers wherever possible	Tower location and line alignment selection	Compensation is implemented for the crop/tree damaged during construction activity.		493	Non	RRVPNL
		Avoid siting new towers on farmland wherever possible	Design of Implementation of crop and tree compensation (based on affected area)	Avoided				
		Farmers compensated for any permanent loss of productive land and trees that need to be trimmed or removed along RoW.	Statutory approvals for tree trimming /removal	During foundation and erection work no trees are involved.		493	Non	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	Towers are being selected/spotted in a manner to avoid such channels		493	Non	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, power generation equipment.	Substation design compliance with fire prevention and control codes	Not applicable		NA		
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	Disruption to other commercial and public activities / Public complaints	As on date there has been no disruption. If any, there		397	Advance published in local News papers	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
		accidental damage to the public utilities Restore the utilities immediately to overcome public inconvenience		shall be advance information published into the local newspaper for electric utility shutdown.				
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.)	We have avoided the work for the locations where there is farming season. Where required, compensation has been provided to the farmers for the loss of cultivated crop. Top soil is restored during the back filling work.	493	Nil	Nil	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	As on date there has been no disruption. If any, there shall be advance information	397	Nil	Nil	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
				published into the local newspaper for electric utility shutdown.				
Equipment layout and installation	Noise and vibrations	Selection of construction techniques and machinery to minimize ground disturbance.	Construction techniques and machinery	All locations are more than 500 mtr away from the residential areas and all activities have been carried out during the day time.	F- 493 Nos E – 397 Nos S-43.161 Kms	Nil	Nil	RRVPNL/TPL
	SF6 leakage during storage and erection of Switchgear	Record of all substation switchgear, storage cylinders located within secure casings	Switchgear casings and substation bounding	Not applicable				
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)	Not applicable				
	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	Not applicable				
	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	Not applicable				
Construction schedules	Noise nuisance to neighboring properties	Minimize construction activities undertaken during the night and local communities informed of the construction schedule.	Timing of construction (noise emissions, [dB(a)])	All Construction activities are being carried out during day time. All the	F- 493 Nos E – 397 Nos S-43.161 Kms	Nil	Nil	RRVPNL/TPL

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
				locations are more than 500 mtrs away from the residential area.				
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 in the TL		Nil	Nil	RRVPNL/TPL
	Contamination of receptors (land, water, air)	Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities.	Amenities for Workforce facilities	All workmen are provided clean water for drinking/cooking/bathing. Proper rented/tent accommodation are provided for their shelter Proper sanitation facilities are provided for all the workmen.	Always	Nil	Nil	RRVPNL/TPL
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 on the bund of field and also dumped to path after discussing with the local persons as per requirement.	493	Need to maintain the same practice up to completion of project.	Nil	RRVPNL/TPL
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	Sprayed water to minimize dust releasing in case of windy and dry weather.	Always	-	-	RRVPNL/TPL

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
				Excavated earth is covered.				
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)	LPG cylinder provided to Labor for cooking purpose.	Always			RRVPNL/TPL
	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 conducted to create awareness among the workers and staff to conserve the flora and funa.	Always			RRVPNL/TPL
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 involve through the TL.	Always			RRVPNL/TPL
	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 tower foundation.	Always			RRVPNL/TPL
Mechanised construction	Noise, vibration and operator safety, efficient	Construction equipment to be well maintained.	Construction equipment -	Construction equipment is	Always	Work carried out with the	Need to	RRVPNL/TPL

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
	operation Noise, vibration, equipment wear and tear	Proper maintenance and turning off plant not in use.	estimated noise emissions and operating schedules	regularly maintained and time to time we maintain a test check of all the machineries		standard norms.	maintain same practice up to completion of project.	
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.	F- 493 Nos E – 397 Nos S-43.161 Kms	Only existing path is used for construction activity.	Need to maintain same practice up to completion of project	RRVPNL/TPL
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 waste removed from the construction site after work completion.	Always			RRVPNL/TPL
Trimming/cutting of trees within	Fire hazards	Trees allowed growing up to a height within the RoW by	Species-specific tree retention as	The tree and bushes	Always	Compensation of same	Non	RRVPNL/TPL -

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
RoW	Loss of vegetation and deforestation	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.	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)	coming within the 26 Meter either side of central line has to be trimmed up height required for the clearance. No vegetation filed involved during the construction activity.		should be given in time.		
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	Always	All work is carrying out with PPE.	Non	RRVPNL/TPL
Nuisance to nearby properties	Losses to neighboring land uses/ values	Contract clauses specifying careful construction practices.	Contract clauses Design basis and layout	Excavated material is used for filling ground itself.	F- 493 Nos E – 397 Nos S-43.161 Kms			RRVPNL/TPL

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
		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.	Reinstatement of land status (area affected, m^2) Implementation of Tree/Crop compensation (amount paid)	Access roads always used for construction activity. Compensation paid against the crop damaged to farmers.				
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)	Not Applicable				
Noise generation	Nuisance to the community around the site	Provision of noise barriers near substation sites	Noise level	Not Applicable				
Soil Erosion	Removal of top soil	Planting of buffer zone species suitable for arid climate.	Turbidity of water (Visual Inspection)	Not Applicable				
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)	Not Applicable				
Substation maintenance	Exposure to electromagnetic interference	Substation design to comply with the limits of electromagnetic interference within floor area	Required vibrations level, instrumentation	Not Applicable				
Oil spillage	Contamination of land/nearby water bodies	Substation transformers located within secure and impervious	Substation bounding	Not Applicable				

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
		bundled areas with a storage capacity of at least 110% of the capacity of oil in transformers and associated reserve tanks.	("as-built" diagrams)					
Operation of Switchgear	Leakage of SF6 gas	Record of all substation switchgear located within secure casings	Switchgear casings and Substation bounding	Not Applicable				

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)	Different loc in the TL	One time	Spot check using field portable instruments National Air quality standards of CPCB [PM10 or PM2.5]	**RRVPNL** **RRVPNL**	**RRVPNL** **RRVPNL**				
	B. Construction Stage	PM_{10}, $PM_{2.5}$, SO_2, NOx, SPM, CO (Visible dust)	Different loc in the TL	Every one month of construction period	Spot check using field portable instruments National Air quality standards of CPCB [PM10 or PM2.5	**TPL**	**RRVPNL**	Agency Finalized, testing under progress, Report shall be submitted by Nov'2016 end.			
	C. Operation Stage (Testing and Commission	PM_{10}, $PM_{2.5}$, SO_2, NOx,	Different loc in the TL	One time during commissioning	Spot check using field portable	**RRVPNL**	**RRVPNL**	Not			

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
	ing)	SPM, CO (Visible dust)			instruments National Air quality standards of CPCB [PM10 or PM2.5			Applicable			
	A. Pre construction stage (Baseline development)	EC, TSS, DO, BOD, P^H Oil and grease, Pb,	Nearest well along the TL	One time	National water quality standards of CPCB	**RRVPNL**	**RRVPNL**				
2.Water Quality	B. Construction Stage	EC, TSS, DO, BOD, P^H Oil and grease, Pb,	Nearest well along the TL	One time during cable laying	National water quality standards of CPCB	**TPL**	**RRVPNL**	Agency Finalized, testing under progress, Report shall be submitted by Nov'2016 end.			
	C. Operation Stage	EC, TSS, DO, BOD, P^H Oil and grease, Pb,	Nearest well along the TL	One time during commissioning	National water quality standards of CPCB	**RRVPNL**	**RRVPNL**	**Not Applicable**			
3.Noise/	A. Pre	Noise	Different	One time	CPCB	**RRVPNL**	**RRVPNL**				

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
Vibration	construction stage (Baseline development)	level [dB(A)]	loc in the TL		standards for Noise and vibrations						
						TPL	**RRVPNL**	Agency Finalized, testing under progress, Report shall be submitted by Nov'2016 end.			
	B. Construction Stage	Noise level [dB(A)]	Different loc in the TL	Every one month of construction period	CPCB standards for Noise and vibrations						
	C. Operation Stage	Noise level [dB(A)]	Different loc in the TL	One time during commissioning	CPCB standards for Noise and vibrations	**RRVPNL**	**RRVPNL**	Not Applicable			
	A. Pre construction stage (Baseline development)	Visible spills and/or soil staining, Oil & grease	1 location along the TL	One time	Hazardous Waste Management rules	**RRVPNL**	**RRVPNL**				
4. Soil						**TPL**	**RRVPNL**	Agency Finalized, testing under progress, Report shall be submitted by			
	B. Construction Stage	Visible spills and/or soil staining, Oil & grease	1 location along the TL	One time	Hazardous Waste Management rules						

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
								Nov'2016 end.			
	C. Operation Stage	Visible spills and/or soil staining, Oil & grease	1 location along the TL	One time during commissioning	Hazardous Waste Management rules	**RRVPNL**	**RRVPNL**	Not Applicable			
SF6	Operation Stage	Volumetric loss from GIS equipment	Substation equipment, circuit breakers	Online monitoring by data loggers	As per Approved Specifications of Equipment	**RRVPNL**	**RRVPNL**	Not Applicable			

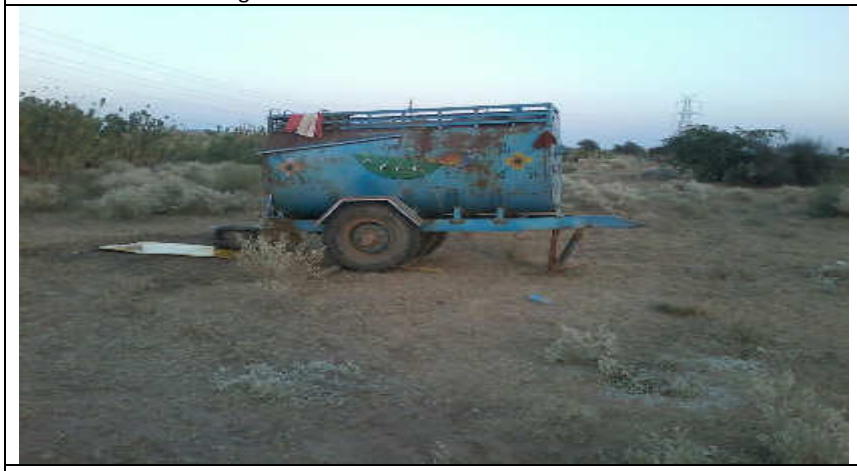
Abbreviations:

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.

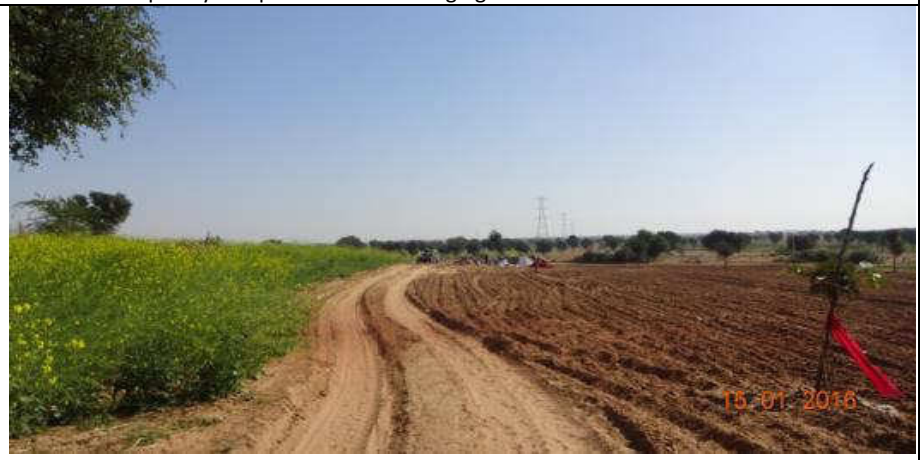
Annexure 1: Photographs regarding EMP issues
Photographs taken during the visit of ADB Consultant Team review

1.1 Colour coding of T&P at store

1.2 Temporary camp of worker at stringing location



1.3 Use of clean water for drinking, cooking and sanitation purpose.

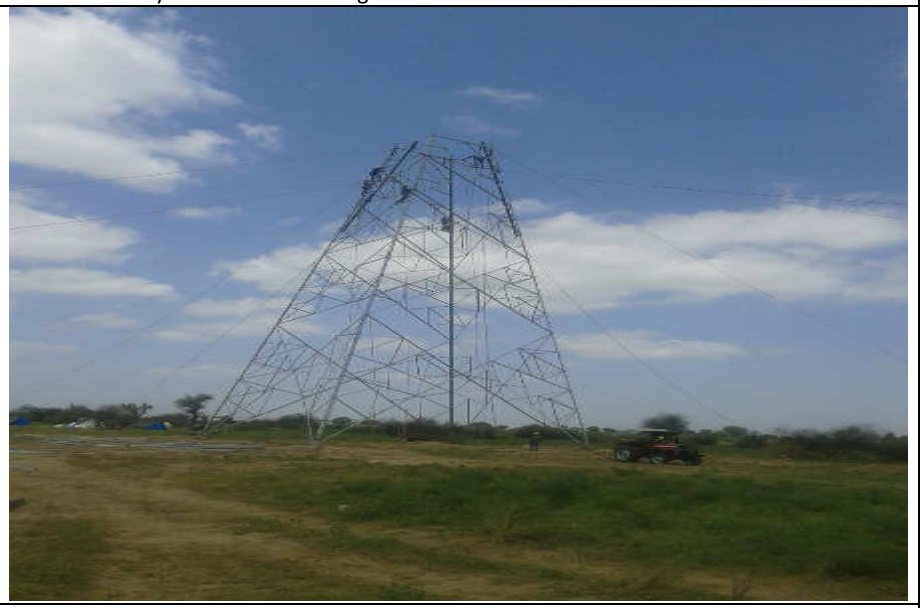


1.4 Access Path towards tower foundation inside agricultural land

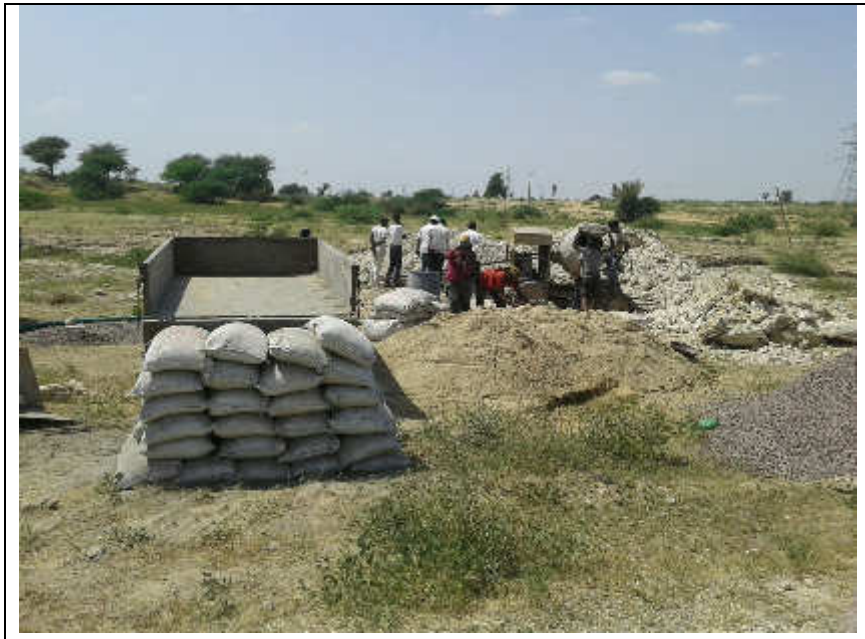
1.5 Storage of equipment and material

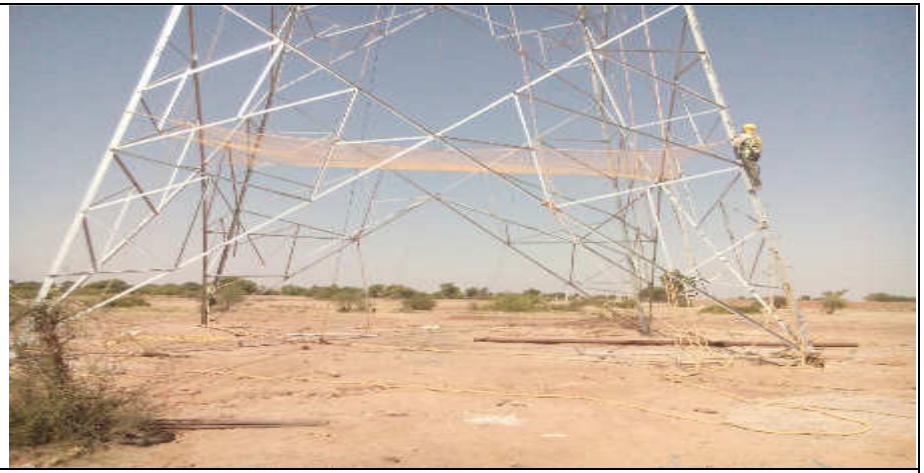
1.6 Safety induction at Strining site before commencement of work.

1.7 Quality initiative training session at Osian office.



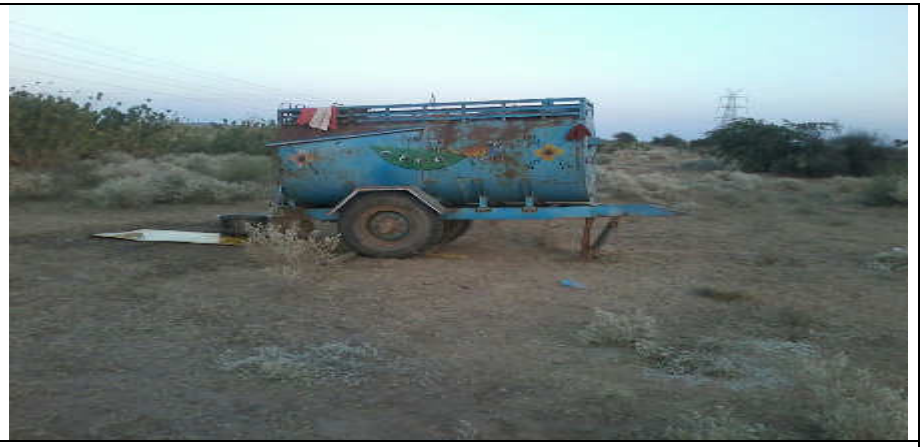
1.8 Tower erection work in progress

	
1.9 Foundation work in progress	1.10 Visit of ADB team at loc no. 20/0 .

	
1.1 Laying of Counterpoise Earthing in ground	1.2 Usage of Safety Net during the Tower erection work for safety of workmen.

	
1.3 Safety Induction training before commencement of work at site.	1.4 Final Sag work in progress during Stringing
	
1.5 Storage of equipment and material	1.6 Temporary camp at Stringing work for tools etc.

1.7 Drinking water at labour camp



1.8 Water at Labor camp for sanitation work

1.9 Tree plantation week celebrated at Store areas.

1.10 Celebration of World's Quality Day at Store office.

Annexure 2:
RVPNL Letter dated 02.11.2016 regarding submission of EMP report

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED
Corporate Identity Number(CIN): U 40109RJ2000SGC016485
Regd. Office: Vidyut Bhawan, Janpath, Jyoti Nagar, Jaipur-302005
OFFICE OF THE SUPTDG. ENGINEER (Contracts-I)
MM Building of RVPN, Old Power House Premises (Back Side),
Near Ram Mandir, Bani Park,Jaipur-302006
email: se.contract1@rvpn.co.in; Website: www.rvpn.co.in

NO.RVPN/SE (Contracts-I)/XEN-1(Contracts)/ICB-6/.D/ 526 Dated 2.11.16

M/s Tata Projects Ltd.
1st Floor, Tower-1,
Okaya Centre, B-5,
Sector-62, Noida-201307 (U.P.)

E-mail: tpl@tataprojects.com,
rifasingh@tataprojects.com
Fax: 91-120 6199990
Phone :- 91-120-6199999

Sub:- Construction of 400 kV D/C Twin ACSR Moose Transmission line from 400/220 kV Pooling Station at Bhadla (Jaisalmer) to LILO point at 400 kV S/C Jodhpur Merta line on turnkey basis against Bid Enquiry No. RVPN/ADB/ Tranche-I/ICB-6------
Approval of Interim bill of Quantity.

Dear Sir(s),

Consequent upon finalization of interim quantities, the amendment in the schedule-1,2,4 & schedule-5, of the contract agreement dated 02/02/15 for prices & quantities of various supply & erection activities for construction of line from 400/220 kVPooling Station at Bhadla (Jaisalmer) to LILO point at 400 kV S/C Jodhpur Merta line is hereby made upto the extent indicated in the following enclosed statements :-

(i) Schedule No. 1(R) - Plant & Equipment (Including Mandatory Spare Parts) Supplied from abroad- **USD 726662** (Revised price).
(ii) Schedule No. 2(R) - Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country- **Rs. 83,93,41,778**(Revised price).
(iii) Schedule No. 4(R) - Local Transportation, Insurance and Other Incidental Services applicable for supply of plant and equipment from within India only-**Rs.5,00,20,617.12** (Revised price).
(iv) Schedule No 5(R) - Instalation and other services-**Rs. 38,09,52,950**(Revised price).
The total Exworks cost of contract as revised BOQ is **Rs. 127,03,15,345 + USD 726662.**

In addition to the above the schedule completion period of the project is also extended by four & half months.-
The ADB has desired that social & environmental safeguard report for the extended length be submitted to the ADB within 15 days from the issuing of this letter under intimation to this office.
This amendment is issued without prejudice to various terms & conditions of the subject contract.

Encl: As above

Yours faithfully,
(R.N. Panwar)
Superintending Engineer (Contracts-I)
RVPN, Jaipur.

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
			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

Location of Sampling along the Tranche -1 transmission lines (December 2011 to January 2012)

S. No	Component	No. Of Sample	Sample No.	Sampling Location
1 and 2	for Air and		Sample No. 1	Village: JajiwalGehlotan, Post: Jajiwal via Mandor, District Jodhpur

	Noise Monitoring	17 each	Sample No. 2	Village and Post: Umed Nagar, Tehsil: Osiyan, District Jodhpur
			Sample No. 3	Near 44 No. Railway crossing, Bhikamkhor, Tehsil: Osiyan, District Jodhpur
			Sample No.4	Village: Amla (Near Kichan), Post and Tehsil: Phalodi, District Jodhpur
			Sample No.5	Village: Khirwa, Post: HidalGol, Tehsil: Phalodi, District Jodhpur)
			Sample No.6	Village: Kanasar, Post: Bap, Tehsil: Phalodi, District Jodhpur)
			Sample No. 7	(Village and Post: Askandra, Tehsil: Pokharan, District Jaisalmer)
			Sample No. 8	Village and Post: Tadana, Tehsil and District Jaisalmer)
			Sample No. 9	Village: Nirudeen Ki Dhani, District Jaisalmer)
			Sample No.10	Village: Nehdai, District Jaisalmer
			Sample No.11	Village: Tanusar, District Jaisalmer
			Sample No.12	Village: Joga, District Jaisalmer
			Sample No. 13	Village: Parewer, District Jaisalmer
			Sample No. 14	Village: Asda, District Jaisalmer
			Sample No. 15	Village: Hadda, District Jaisalmer
			Sample No.16	Hamira Rly Station, Village: Thaiyat, District Jaisalmer)
			Sample No.17	Village: BhaguKaGaon, District Jaisalmer
3	Water Analysis	7	Sample No. 1	Water sample collected from Pond, Village: JajiwalGehlotan, Post: Jajiwal via Mandor, District Jodhpur
			Sample No. 2	Water sample collected from Bore well of Sukh Ram S/o ShriBhagirathRam, Village: Sirmandi, Post and Tehsil: Osiyan, District Jodhpur
			Sample No. 3	Water sample collected from Bore well of Manish S/o ShriPannaLalJi, Village: Amla, Post and Tehsil: Phalodi, District Jodhpur
			Sample No.4	Water sample collected from Govt. Bore well, Village and Post: Askandra, Tehsil: Pokharan, District Jaisalmer
			Sample No.5	Water sample collected from Water Tank of Babu Singh S/o ShriBagh Singh, Village: Tanusar, Jaisalmer
			Sample No.6	Water sample collected from Govt, Bore well, Village: Joshiyan (Hadda), Post: Kanod, Tehsil: and District: Jaisalmer
			Sample No.7	Water sample collected from Govt. Bore well, Village and Post: BhaguKaGaon, Tehsil and District: Jaisalmer
4	Soil Analysis	7	Sample No. 1	Soil sample collected from the Pond of Village: JajiwalGehlotan, Post: Jajiwal via Mandor, District Jodhpur
			Sample No. 2	Soil sample collected from the land of Sukh Ram S/o ShriBhagirath Ram, Village: Sirmandi, Post and Tehsil: Osiyan, District Jodhpur
			Sample No. 3	Soil sample collected from the land of Manish S/o ShriPannaLalJi, Village: Amla, Post and Tehsil: Phalodi, District Jodhpur
			Sample No.4	Soil sample collected from the land of Padam Singh S/o ShriChandan Singh Ji, Village and Post: Askandra, Tehsil: Pokaran, District Jaisalmer
			Sample No.5	Soil sample collected from the land of Babu Singh S/o ShriBagh Singh, Village: Tanusar, Jaisalmer)
			Sample No.6	Soil sample collected from the land of BheraramJi S/o ShriManglaramJi Village: Hadda, Post: Kanod, Tehsil and District Jaisalmer
			Sample No.7	Soil sample collected from the land of Barkat Khan S/o ShriJalu Khan, Village and Post: BhaguKaGaon, Tehsil and District: Jaisalmer

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: 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

iii. Ambient Air Quality Monitoring Report along 3 nos. 440 KV Transmission Lines (December 2011 to January 2012)

Sample No	Site	Particulate Matter (PM 2.5)	Particulate Matter (PM 10)	Sulphur Dioxide (SO2)	Oxide of Nitrogen (NOX)	Carbon Monoxide as (CO)
1	Near NageshwarMahadev Temple, Village: JajiwalGehlotan, Post: Jajiwalvia Mandor, District Jodhpur	33.6 μg / m3	65.5 μg / m3	6.3 μg / m3	9.7 μg / m3	458 μg / m3
2	Near 33 KVA Sub Station, Village and Post: Umed Nagar, Tehsil: Osiyan, District Jodhpur	36.2 μg / m3	70.5 μg / m3	6.6 μg / m3	9.8 μg / m3	573 μg / m3
3	Near 44 No. Railway crossing, Bhikamkhor, Tehsil: Osiyan, District Jodhpur	39.5 μg / m3	62.3 μg / m3	6.8 μg / m3	10.1 μg / m3	687 μg / m3
4	Near house of Manish S/o ShriPannaLalJi, Village: Amla (Near Kichan), Post and Tehsil: Phalodi, District Jodhpur	24.1 μg / m3	52.3 μg / m3	6.2 μg / m3	9.5 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)
5	Near NayaTalab, Village: Khirwa, Post: HidalGol, Tehsil: Phalodi, District Jodhpur)	22.6 μg / m3	47.8 μg / m3	6.1 μg / m3	9.3 μg / m3	458 μg / m3
6	(Near house of Gopal S/o ShriPrem Pal Vishnoi, Village: Kanasar, Post: Bap, Tehsil: Phalodi, District Jodhpur)	30.5 μg / m3	62.3 μg / m3	6.3 μg / m3	9.8 μg / m3	573 μg / m3
7	Crossing point at Askandra – Nachna Road, Village and Post: Askandra, Tehsil: Pokharan, District Jaisalmer	41.5 μg / m3	76.6 μg / m3	7.6 μg / m3	11.9 μg / m3	687 μg / m3
8	Near Stone Quarry, Nachna – Tadana Road, Village and Post: Tadana, Tehsil and District Jaisalmer)	24.0 μg / m3	52.6 μg / m3	6.7 μg / m3	9.6 μg / m3	458 μg / m3
9	Near Nirudeen Ki Dhani, District Jaisalmer)	18.6 μg / m3	41.4 μg / m3	6.0 μg / m3	9.0 μg / m3	344 μg / m3
10	Near PandiDungari, Village: Nehdai, District Jaisalmer	21.8 μg / m3	49.4 μg / m3	6.1 μg / m3	9.3 μg / m3	344 μg / m3
11	Near house of Babu Singh S/o ShriBagh Singh, Village: Tanusar, District Jaisalmer	23.0 μg / m3	52.4 μg / m3	6.2 μg / m3	9.6 μg / m3	458 μg / m3
12	Village: Joga, Post. Sauiwa, Tehsil and District Jaisalmer	25.7 μg / m3	59.8 μg / m3	6.2 μg / m3	9.5 μg / m3	458 μg / m3
13	Near Tulsiram Ki Dhani, Village: Parewer, Tehsil and District Jaisalmer)	28.0 μg / m3	62.4 μg / m3	6.5 μg / m3	9.7 μg / m3	573 μg / m3
14	Near house of Fajal Khan S/o ShriViram Khan, Village: Asda, Post: Deva, Tehsil and District Jaisalmer	32.0 μg / m3	62.5 μg / m3	6.3 μg / m3	9.8 μg / m3	573 μg / m3
15	Near Mile Stone KM. 3, Village: Hadda, Post: Kanod, Tehsil and District Jaisalmer	34.2 μg / m3	71.7 μg / m3	6.8 μg / m3	10.9 μg / m3	687 μg / m3
16	Near Hamira Rly Station, Village: Thaiyat, District Jaisalmer	31.9 μg / m3	67.1 μg / m3	6.8 μg / m3	9.7 μg / m3	573 μg / m3
17	Near house of Barkat Khan S/o ShriJalu Khan, Village and Post: BhaguKaGaon, Tehsil and District Jaisalmer	23.0 μg / m3	56.2 μg / m3	6.3 μg / m3	9.5 μg / m3	573 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 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

iii. Ambient Noise Monitoring Report for Along the 3 400 kV transmission lines (December 2011 to January 2012)

Sample No	Site	Ld (Day Equivalent)	Ln (Night Equivalent)	Ldn (Day-Night Equivalent)
1	Village: JajiwalGehlotan, Post: Jajiwal via Mandor, District Jodhpur	47.18	41.61	49.20
2	Village and Post: Umed Nagar, Tehsil: Osiyan, District Jodhpur	52.82	43.64	53.11
3	Near 44 No. Railway crossing, Bhikamkhor, Tehsil: Osiyan, District Jodhpur	49.73	41.23	50.29
4	Village: Amla (Near Kichan), Post and Tehsil: Phalodi, District Jodhpur	54.09	42.03	53.51
5	Village: Khirwa, Post: HidalGol, Tehsil: Phalodi, District Jodhpur)	51.05	41.88	51.34
6	Village: Kanasar, Post: Bap, Tehsil: Phalodi, District Jodhpur)	48.00	44.12	51.07
7	(Village and Post: Askandra, Tehsil: Pokharan, District Jaisalmer)	49.90	43.03	51.21
8	Village and Post: Tadana, Tehsil and District Jaisalmer)	52.64	42.43	52.57
9	Village: Nirudeen Ki Dhani, District Jaisalmer)	44.38	40.87	47.71
10	Village: Nehdai, District Jaisalmer	50.58	42.08	51.14
11	Village: Tanusar, District Jaisalmer	49.67	41.20	50.24
12	Village: Joga, District Jaisalmer	47.29	41.42	49.13
13	Village: Parewer, District Jaisalmer	49.94	41.74	50.62
14	Village: Asda, District Jaisalmer	47.82	41.59	49.47
15	Village: Hadda, District Jaisalmer	48.06	41.79	49.68
16	Hamira Rly Station, Village: Thaiyat, District Jaisalmer)	52.63	42.40	52.55
17	Village: BhaguKaGaon, District Jaisalmer	49.20	41.86	50.27

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	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

iii. Analysis Report of Soil along Transmission lines (December 2011 to January 2012)

Sample No		1	2	3	4	5	6	7
Parameters (Unit)	Unit	Results JajiwalGehlotan, Jodhpur	Village: Sirmandi, Jodhpur	Village: Amla, Jodhpur	Village Askandra, Jaisalmer	Village: Tanusar, Jaisalmer	Results Village: Hadda, Jaisalmer	Village: BhaguKaGaon, Jaisalmer
Color	Visual Comparison	Grey	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown	Light Brown
pH (1:5)	-	7.58	7.33	7.31	7.23	7.12	7.7	7.06
Conductivity(1:5)	(μS/cm)	406	340	424	110	2520	146	1795
Moisture	(%)	2.64	2.06	2.49	0.06	1.98	0.30	0.34
Chlorides as Cl	(%)	0.007	0.016	.016	0.003	0.005	0.004	0.072
Sulphate as SO4	(%)	0.014	0.012	0.004	0.008	0.156	0.009	0.068
Total Carbonates	(%)	13.88	1.17	6.95	2.91	21.96	11.56	22.54
Total Soluble Solids	(%)	0.201	0.158	0.165	0.136	1.199	0.108	0.708
Total Organic Matter	(%)	0.187	0.037	0.091	0.026	0.029	0.034	0.004
Nitrogen as N	(%)	0.020	0.013	0.021	0.008	0.005	0.009	0.119
Phosphorus as P	(%)	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Potassium as K	(%)	0.007	0.003	0.004	0.002	0.015	0.003	0.007
Zinc	Mg / 100 Gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Copper	Mg / 100 Gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	Mg / 100 Gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cadmium	Mg / 100 Gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Nickel	Mg / 100 Gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Lead	Mg / 100 Gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL

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

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 ShriKalu 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

iii. Analysis Report of Water Along the 3 nos. 400 kV transmission lines (December 2011 to January 2012)

iv.

Sample No. 1 (Water sample collected from Pond, Village: JajiwalGehlotan, Post: Jajiwal via Mandor, 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**	
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	2.3	5	10	IS: 3025 Part 10 - 1984
pH	7.75	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	100.00 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	57.98 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	580.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984

Calcium as Ca	30.40 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	33.30 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	8.12 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.00 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	192.00 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	80 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

CFU-Colony Forming Unit

Sample No. 2: (Water sample collected from Bore well of Sukh Ram S/o ShriBhagirath Ram, Village: Sirmandi, Post and Tehsil: Osiyan, 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**	
1.1.1.1.5 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	7.88	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	0.08 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	591.82 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	3,619.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	113.60 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	74.48 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	185.06 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	16.82 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.50 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	260.00 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	16 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

CFU-Colony Forming Unit

Sample No. 3: (Water sample collected from Bore well of Manish S/o ShriPannaLalJi, Village: Amla, Post and Tehsil: Phalodi, 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**	
1.1.1.1.6 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	7.13	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	300.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.04 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	127.96 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	1,245.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	73.60 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	28.42 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	77.41 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986

Nitrate as NO3	19.66 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.16 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	352.00 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	18 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

CFU-Colony Forming Unit

Sample No.4: (Water sample collected from Govt. Bore well, Village and Post: Askandra, Tehsil: Pokharan, 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**	
1.1.1.1.7 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	7.78	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	600.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.11 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	404.87 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	3,081.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	104.00 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	83.30 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	152.63 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	173.00 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.30 Mg / L	1.0 Mg / L	1.5 Mg / L	IS: 3025 Part 60 - 2008
Phenolic Compounds as	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	IS: 3025 Part 43 - 1991

C6H5OH				
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	340.00 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	13 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

CFU-Colony Forming Unit

Sample No.5: (Water sample collected from Water Tank of Babu Singh S/o ShriBagh Singh, Village: Tanusar, 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**	
1.1.1.1.8 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	7.39	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	344.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.04 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	33.98 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	748.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	97.60 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	49.97 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	13.95 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	0.55 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	240.00 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	23 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

CFU-Colony Forming Unit

Sample No.6 (Water sample collected from Govt, Bore well, Village: Joshiyan (Hadda), Post: Kanod, Tehsil: and 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**	
1.1.1.1.9 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	7.71	6.5 – 8.5	-	IS: 3025 Part 11 - 1984
Essential Characteristics-Chemical Parameters				
Total Hardness as CaCO3	396.00 Mg / L	300 Mg / L	600 Mg / L	IS: 3025 Part 21 - 1983
Iron as Fe	0.09 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	427.87 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	3,161.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	84.80 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	45.08 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	173.52 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	0.74 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.72 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	452.00 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	10 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

CFU-Colony Forming Unit

Sample No.7: (Water sample collected from Govt. Bore well, Village and Post: BhaguKaGaon, Tehsil and 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	**1.1.1.1.10 Permissible Limit in absence of alternate source**	
1.1.1.1.11 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	8.22	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	< 0.01 Mg / L	0.3 Mg / L	1.0 Mg / L	IS: 3025 Part 53 - 2003
Chloride as Cl	129.96 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	1,455.00 Mg / L	500 Mg / L	2000 Mg / L	IS: 3025 Part 16 - 1984
Calcium as Ca	24.00 Mg / L	75 Mg / L	200 Mg / L	IS: 3025 Part 40 - 1991
Magnesium as Mg	14.70 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	121.67 Mg / L	200 Mg / L	400 Mg / L	IS: 3025 Part 24 - 1986
Nitrate as NO3	0.32 Mg / L	45 Mg / L	No relaxation	IS: 3025 Part 34 - 1988
Fluoride as F	1.86 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	364.00 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	26 CFU	10 CFU	10 CFU	IS: 1622 - 1981
E. Coli	Absent	Absent	Absent	IS: 1622 - 1981

Significance of Water analysis

Parameter	**Results**	**Desirable Limit**	**Permissible Limit in absence of alternate source**	**Instrument Detection Limit**	**Undesirable effect outside the Desirable Limit**
Color, Hazen Units	< 1	5	25	1	Above 5 consumer acceptance decreases
Turbidity, NTU	< 1	5	10	1	Above 5 consumer acceptance decreases
Residual Free Chlorine	< 0.1 Mg / L	0.2 Mg / L	-	0.1 Mg / L	To be applicable when water is chlorinated
Copper as Cu	< 0.02 Mg / L	0.05 Mg / L	1.5 Mg / L	0.02 Mg / L	Encrustation in water supply structure and adverse effects on domestic use
Manganese as Mn	< 0.01 Mg / L	0.1 Mg / L	0.3 Mg / L	0.01 Mg / L	Beyond this limit taste/appearance are affected, has adverse effect on domestic uses and water supply structures
Phenolic Compounds as C6H5OH	< 0.001 Mg / L	0.001 Mg / L	0.002 Mg / L	0.001 Mg / L	Beyond this, it may cause objectionable taste and odour
Mercury as Hg	< 0.2 µg / L	0.001 Mg / L	No relaxation	0.2 µg / L	Beyond this, the water becomes toxic
Cadmium as Cd	< 0.005 Mg / L	0.01 Mg / L	No relaxation	0.005 Mg / L	Beyond this, the water becomes toxic
Selenium as Se	< 0.005 Mg / L	0.01 Mg / L	No relaxation	0.005 Mg / L	Beyond this, the water becomes toxic
Arsenic as As	< 0.005 Mg / L	0.05 Mg / L	No relaxation	0.005 Mg / L	Beyond this, the water becomes toxic
Cyanide as CN	< 0.02 Mg / L	0.05 Mg / L	No relaxation	0.02 Mg / L	Beyond this, the water becomes toxic
Lead as Pb	< 0.01 Mg / L	0.05 Mg / L	No relaxation	0.01 Mg / L	Beyond this, the water becomes toxic
Zinc as Zn	< 0.02 Mg / L	5 Mg / L	15 Mg / L	0.02 Mg / L	Beyond this limit it can cause astringent taste and an opalescence in water
Anionic Detergents as MBAS	< 0.1 Mg / L	0.2 Mg / L	1.0 Mg / L	0.1 Mg / L	Beyond this limit it can cause a light froth in water
Chromium as Cr+6	< 0.02 Mg / L	0.05 Mg / L	No relaxation	0.02 Mg / L	May be carcinogenic above this limit
Mineral Oil	< 0.01 Mg / L	0.01 Mg / L	0.03 Mg / L	0.01 Mg / L	Beyond this limit undesirable taste and odour after chlorination take place Toxic
Aluminum as Al	< 0.005 Mg / L	0.03 Mg / L	0.2 Mg / L	0.005 Mg / L	Beyond this limit taste becomes unpleasant Cumulative effect is reported to cause dementia
Boron as B	< 0.02 Mg / L	1 Mg / L	5 Mg / L	0.02 Mg / L	-

Annexure 4: Tata Projects Limited Reply to RVPNL Letter dated 21.11.2016 regarding EMP report submission

Ref: TPL/T & D/ICB 6/16-17/ 109 **Date: 21st Nov '16**

The Assistant Engineer (T&C-Kankani)
Rajasthan RajyaVidyutPrasaran Nigam Ltd.,
Jodhpur, Rajasthan-342006

Sub: Construction of 400 kV D/C Twin ACSR Moose Transmission Line from 400/220 kV Pooling station Bhadla (Jaisalmer) to LILO point at 400kV S/C Jodhpur Meerta Line.(Package-ICB-06). **Submission of EMP reports for onward submission to ADB**

Ref: RVPNL Letter no. RVPN/SE/CONTRACTS)/XEN-1/(CONTRACTS)/ICB 6/D. 526 dated 02.11.2016

Dear Sir,

In regards to the subject line, we request your good self to kindly forward the attached EMP reports for the submission to ADB. The reports attached are:

1. ICB -6 Social Monitoring Report_RRVPNL- Tranche-1_RRETIP_RRVPNL - **Additional 40 Kms**- March'2015 to Oct'2016 (Report No. 02)
2. Environment Monitoring Report- 400 kV DC Bhadla to Jodhpur ICB 6 - **Additional 40 Kms**- March'2015 to Oct'2016 (Report No. 02)
3. ICB -6 Social Monitoring Report_RRVPNL- Tranche-1_RRETIP_RRVPNL - **160 kms April- 2016 to Oct -16** (Report No. 03)
4. Environment Monitoring Report- 400 kV DC Bhadla to Jodhpur ICB 6 - **160 kms April-2016 to Oct -16** (Report No. 03)

Thanking you and assuring you the best of our services at all the times.

Yours faithfully
For **Tata Projects Limited**

(P P Singh Rathore)
RCM

CC:
1. **Superintending Engineer-T&C, KAKANI, RRVPNL, Jodhpur.**
2. **Executive Engineer-T&C, KAKANI, RRVPNL, Jodhpur.**

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