Initial Environmental Examination

Project Number: 47100-004
July 2018

IND: Madhya Pradesh Power Transmission and Distribution System Improvement Project

Submitted by:

Madhya Pradesh Paschim Kshetra Vidyut Vitaran Co. Ltd. (DISCOM-W), Indore

Asian Development Bank

पेज लॉगिंग Pls
Nilesh Kumar / JB.

म.प्र.प.क्षे.वि.वि.कं. लिमिटेड, इंदौर

OFFICE OF THE MANAGING DIRECTOR
M. P. Paschim Kshetra Vidyut Vitran Co. Ltd.
(Wholly Owned by Government of M.P. Undertaking)
GPH COMPOUND, POLOGROUND, INDORE
(EPABX Phone No. 0731-2426130, 2426200 Fax No. 2423300, 2421346)
E-mail-mpwzadb@rediffmail.com

No. MD/WZ/08-01/ADB-III/4324

Indore/Dated: **27.02.2018**

Registered Post

ASIAN DEVELOPMENT BANK
INRM
01 MAR 2018
3783
RECEIVED

To,

Mr. Kenichi Yokoyama,
Country Director,
Indian Resident Mission,
Asian Development Bank
4 San Martin Marg,
Chanakyapuri, New Delhi 110021

Sub: Loan No.3066-IND: Madhya Pradesh Power Transmission and Distribution System Improvement Project: Submission of Updated **Initial Environment Examination Report (IEE)** of Madhya Pradesh Paschim Kshetra Vidyut Vitaran Company Limited (DISCOM-W).

Ref: Your Letter dated 28.12.2017 and T.O. Email Dated: 20.01.2018.

Dear Sir,

The updated **Initial Environment Examination Report (IEE)** of Loan 3066-IND, pertaining to DISCOM-W after discussion of our environment consultant and our Executive Engineer, Shri Himanshu Dube (ADB CELL) with ADB safeguard experts and incorporating all the rectifications/suggestions along with the desired compliance matrix is hereby submitted for ADB's review and approval please.

Encl: As above: IEE report in 2 copies.

Thanking You

Sincerely,

(Dr. V.K.Goel)
Project Director (ADB)
Madhya Pradesh Paschim
Kshetra Vidyut Vitaran Co. Ltd.
(DISCOM-W) O/o MD (WZ)

Copy to:

1.) Shri. J. Banerjee, Sr. Project Officer (Energy) INRM, Asian Development Bank, 4 San Martin Marg, Chanakyapuri, New Delhi-110021
2.) Shri. Girish Mahajan, Senior Environment Officer, INRM, Asian Development Bank, 4 San Martin Marg, Chanakyapuri, New Delhi-110021

-sd-
(Dr. V.K.Goel)
Project Director (ADB)
Madhya Pradesh Paschim
Kshetra Vidyut Vitaran Co. Ltd.
(DISCOM-W) O/o MD (WZ)

ASIAN DEVELOPMENT BANK
INRM
2948
NK
01 MAR 2018
RECEIVED
Soft copy recd 1.03.18

Initial Environmental Examination (Final Updated)

January 2018

Madhya Pradesh Paschim Keshtra Vidyut Vitaran Co. Limited- DISCOM-WEST,

GPH, Compound, Pologround, INDORE (MP)

Distribution System Improvement Project Under ADB Loan-IND-3066

Prepared by:

SMS Envocare Limited

Vijay Nagar, Indore, M.P.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDIX PAGE NO.

CURRENCY EQUIVALENTS

(As of 1 January 2018)
Currency Unit – Indian Rupee (Rs)
Rs 1.00 = $0.02
$1.00 = Rs 63.48

ABBREVIATIONS

ADB	– Asian Development Bank
CEA	– Central Electricity Authority
CPCB	– Central Pollution Control Board, Government of India
DC or D/C	– Double Circuit
DPR	– Detailed Project Report
DISCOM-W	– Distribution Company- West
EA	– Executing Agency
EIA	– Environmental Impact Assessment
EMoP	– Environmental Monitoring Plan
EMP	– Environmental Management Plan
EHV	– Extra High Voltage
EPC	– Engineering, Procurement and Construction
GoMP	– Government of Madhya Pradesh
GoI	– Government of India
GRM	– Grievance Redress Mechanism
IA	– Implementing Agency
IEE	– Initial Environmental Examination
LILO	– Line in – Line out
MOEF&CC	– Ministry of Environment, Forests& Climate Change, Govt of India
MP	– Madhya Pradesh
MPPK	–MP Paschim Keshtra Vidyut Vitaran Co. Limited
MPPCB	– MP State Pollution Control Board
MPSEB	– MP State Electricity Board
PMU	– Project Management Unit
ROW	– Right of Way
RP	– Resettlement Plan
TA	– Technical Assistance

WEIGHTS AND MEASURES

ha (hectare)	– 10,000 sq m
km (kilometer)	– 1,000 m
kV	– Kilovolt (1,000 volt)
kWh	– Kilowatt-hour
mG	– milliGauss
MVA	– Megavolt-Ampere
MW	– Mega Watt
^{o}C	– degree Celsius

EXECUTIVE SUMMARY

1. Introduction

1. To improve the quality and reliability of service in the power transmission and distribution system networks, the Government of Madhya Pradesh (GoMP) has taken initiatives to invest in the power sector with funding from development partners like the Asian Development Bank (ADB). The investments involve expansion, upgrading and reconfiguration of the existing power transmission and distribution networks.

2. A combined IEE report for all distribution companies & power distribution were submitted for ADB"s approval in September, 2013. However, during the course of progress of the works & survey, there were location changes in some substations, further some distribution lines were also added to the same project and some were dropped as they were no longer necessary. In case of substations, eight substations were changed site location from the original scope of work. In light of these changes, the IEE report is updated in January 2018 to reflect site location changes of 8 nos substation of proposed new 40 nos 33/11 KVA substations, 33 KVA feeder birfurcation distribution lines and also to incorporate the new scope of 100 KVA DTR & associated distribution 11 KV & LT lines mentioned in table no.3.1 under DISCOM-West jurisdiction covering Indore & Ujjain regions.

2. Project Description

3. The Project has comparising major distribution system improvement including capacity building for the executing agency staff. The executing agency (EA) for the project is MP Paschim Keshtra Vidyut Vitaran Co Limited, Indore as DISCOM-W for distribution system improvement for Indore & Ujjain circle. The distribution system improvement component in respect of DISCOM-West will include the construction of new 33/11 kV substations, bifurcation of overloaded 33 kV feeders, additional/augmentation of power transformers, installation of distribution transformers and capacitor banks. An additional 40 new 33/11 kV substations are proposed to be constructed. During the progress of project, 8 nos site location of substations has been changed with respect to originally proposed due to non-avilibility of Government land. All changed site locations are proposed to construct on Govt land only. Installation of permanent 100 KVA Distribution Transformers in place of temporary rental Distribution transformers and associated 11

KVA & LT Line have been added to project activites with following technical objectives are:-

- Flattening of load curve in a judicial way. Therefore reducing the cost of power purchase and to minimise penalties for under Drawl etc.
- Better supply for agricultural consumers.
- Reduction of T& D and AT&C Losses.
- System strengthening by improving the infrastructures.
- To improve voltage profile for rural Domestic consumer.

4. The distribution system improvement component in respect of DISCOM-West will include the construction of new 33/11 kV substations, bifurcation of overloaded 33 kV feeders, additional / augmentation of power transformers, installation of distribution transformers and capacitor banks.

5. The capacity building component will include supporting DISCOM training center to provide training for the EA staff. Training will include induction training for new staff, and training on new technology, project management, procurement, monitoring and evaluation, financial management, and safeguards for existing staff. Ten trainers and 15 to 20 EA staff of DISCOM-West are being trained with the support of the project. Part of the capacity building component of the Project is safeguards training for the DISCOM-West-EAs.

3. Environmental Requirements

6. The Safeguard Policy Statement 2009 (SPS 2009) of ADB sets out the requirements for environmental safeguard that applies to all ADB-financed projects. Under the SPS 2009, the project is classified as B on environment requiring the preparation of an initial environmental examination (IEE). Following the requirements of SPS 2009, this updated IEE is prepared covering the components of the going on project on distribution system improvement of DISCOM-West jurisdiction for Indore & Ujjain regions.

7. The Ministry of Environment and Forests (MoEFCC), GoI, in its notification in September 2006, has exempted Distribution & distribution projects from environmental clearances due to the non-polluting nature of its activities.[1] However, forest clearances under the Forest Conservation Act 1980 will be necessary in the event that Distribution / distribution line passes through forest areas, if any.

[1] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).

4. Anticipated Environmental Impacts and Mitigation Measures

8. The selection of the subprojects included in the distribution system improvement was guided by 13 site selection criteria and a 17-question checklist with an overall objective of avoiding potential significant adverse environmental impacts and land acquisition. Distribution line subprojects traverse mainly agricultural land planted to soybean rice, corn, vegetables and other seasonal crops. No subproject is located within the areas declared as forest by MoEFCC, cultural and archaeological sites considered of national importance, and the nine national parks and 25 wildlife sanctuaries in Madhya Pradesh.

9. The subprojects are not expected to cause significant adverse environmental impacts but may cause temporary impacts during construction such as increased noise and dust level that may cause inconvenience to local people, accumulation of scrap materials/debris, and increased presence of workers at substation construction sites which can be readily mitigated by good construction engineering practices and proper planning. The distribution system improvement will include upgrading of existing 33/11 kV substations which may involve dismantling of equipment. Scrap material that are still useful will be stored in the warehouse of the EAs in Indore and Ujjain.

10. An environmental management plan and environmental monitoring plan has prepared with respect to changes of originally proposed location of 8 nos substations of total 40 nos of sbstations of PPR-41-Lot-I & II including extra 33 KVA distribution lines 632.8 km having 284 km in Indore & 348.8 km in Ujjain for additional feeder birfucation. New scope of permanent installation of 1221 nos 100 KVA DTR in place of temperory rental distribution transformers & additional 623 km associated 11 KV distributions lines of Indore (210 km) & Ujjain (413 km) covered in PPR-42 Lot-I & II under DISCOM-West, Also requires distribution LT lines of 504 km having Indore (171 km) & Ujjain (333 km) are proposed in PPR -42-Lot-I & II, now additional scope of total 11 KV distribution lines with LT lines comes 1127 km shown in Table E.1 and Table E.2, respectively.

5. Information Disclosure, Consultation, and Participation

11. Initial consultations were done during the site visits held on July 23-26, 2013 & updation in January 2018. Consultations with project stakeholders in varying degrees will continue throughout the life of the project. Concerns of local people were common and they include: (i) load shedding and lack of reliable and stable supply of power affecting their produce and livelihood, and (ii) timely compensation to farmers affected during

construction of substations, erection of the distribution poles, and stringing of the conductors. Local people are aware of the proposed project and are generally supportive due to expected long-term benefit of reliable and stable supply of power.

12. This final updated IEE will be posted on the ADB website as required by SPS 2009 and Public Communications Policy 2011. A project factsheet or a frequently asked questions flyer in Hindi will be made available at the EAs field offices. Aside from this public disclosure requirement, the Right to Information Act 2005 of GoI also provides for additional obligation for the EAs to provide information about the project.

6. Institutional Set-up & Implementation Arrangements

13. A Project Management Unit (PMU) of DISCOM-West had already set in EA responsible for project management and safeguards compliance monitoring of contractor(s) during construction. The PMU has hired an environmental consultant & Nodel Officers, prior to the award of the civil works contract who are primarily responsible for ensuring that the EMP is properly implemented and being prepared the environmental monitoring reports for submission to ADB at least twice a year during construction, and annually during operation phase. PMU had incorporated terms & conditions in work orders placed to EPC Contractor(s) of their responsibility to comply with the EMP and the requirements of ADB.

7. Grievance Redress Mechanism

14. A grievance redress mechanism had established by the PMU-DISCOM-West to EA to deal with complaint(s) from affected persons (APs) during implementation. APs can seek redress of their grievance at three levels: (i) the PMU at conerning EA, (ii) the grievance redress committee (GRC), and (iii) the appropriate courts of law. GRC is set up by the PMU in concerning EA as soon as the project commences and doing function as such from construction to operation. The PMU in concerinng EA is ensures the representation of women on the members of GRC which consist of representatives from the local *Panchayat* Head, a District Revenue Commissioner, representative from the EPC Contractor(s) only during construction phase, designated staff of EA on safeguards, Manager/Director of EA, and a witness of the complainant/affected person.

8. Conclusions and Recommendations

15. The subprojects were selected following criteria and appropriate survey methods with the objectives of avoiding the potential significant adverse environmental impacts and land acquisition. Distribution line routes traverse primarily agricultural lands planted to soybean, rice, corn, vegetables and other cash crop. No subproject is located near or within environmentally-sensitive areas such as forest declared by MoEFCC, archeological and excavation sites of national importance, the nine national parks and 25 wildlife sanctuaries in Madhya Pradesh.

16. None of the subprojects are expected to cause significant adverse environmental impacts during construction and also during operation. However, vegetation and land clearing within the right of way and the substation sites will be required which can be easily mitigated by proper planning, consultation, and best practices in construction engineering. Mitigation measures are included in the environmental management plan and parameters for monitoring have been identified in the environmental monitoring plan.

17. Consultations with local people that may be potentially affected by the project show that their concerns are common as: (i) load shedding and lack of reliable and stable supply of power affecting their produce and livelihood, and (ii) timely compensation to farmers affected during construction of substations, erection of the Distribution poles, and stringing of the conductors. Overall, local people are aware of the proposed project and are generally supportive due to expected long-term benefit of reliable and stable supply of power as well as employment opportunities resulting from the project. Consultations will continue throughout the life of the project. A grievance redress mechanism will be set up by the PMU in each EA to properly address complaints and issues that may arise from affected persons during implementation.

18. This updated IEE will be publicly disclosed at the ADB website as required by SPS 2009 and Public Communications Policy 2011. A project brief and/or factsheet will be prepared in Hindi and made available to the public at the PMU-field offices of each EA. A workshop/training on safeguards is included in the component on capacity building. The reliability and stability of power supply resulting from the project is expected to improve the quality of life and the pace of economic development in Madhya Pradesh.

TABLE E.1 ENVIRONMENTAL MANAGEMENT PLAN

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
Planning and Pre-Construction Stage					
Preparation of feasibility study and detailed project report (DPR) • Location of substation and distribution lines • Choice of equipment and technology • Change of location of 8 nos Substation out of original proposed 40 nos substation & augmentation • 100 KVA Distribution Transformers and Associated 11 KV & LT distribution lines	• Land and vegetation	• Loss of agricultural land and crops • Loss of habitat and vegetation clearing • Land acquisition • Increase in soil erosion and impact to soil productivity	• Use of 13 criteria for site selection which include environmental factors to minimize potential impacts • Use of 17-question checklist/questionnaire in evaluating substation sites which aim at avoidance of land acquisition and environmental impacts • Substations are all on government land (40 nos-S/s- DISCOM-West) including 8 nos change of site locations • No land acquisition required but transfers of ownership from the government to DISCOM-West • 40 nos Substation of 33/11 kV (including change of 8 nos site location), additional 33 KVA distribution lines for feeder birfurcation and additional 1127 KM of 11 KVA & LT distribution line will not have impact on on environment & away from traverse forest, sanctuary, or protected areas. • Use of mineral oil such as Duralife Transformer Oil for transformers (generally occurs in operation phase) • Use of air insulated substations to avoid fugitive emissions of SF_6 (a potent GHG gas)	Included in the Project Costs Associated costs of land transfers from the Government will be borne by DISCOM-W	MP-DISCOM-W, District Commissioner Office
	• People	• Physical displacement of people and structures • Economic loss to people • Disturbance and inconvenience to people due to traffic, increased noise and dust levels, vibration • Interference to existing utilities			
	• Water	• Interference to local drainage • Water quality impacts due to erosion and/or sedimentation			

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
	• Air	• Increase dust and noise levels, and vibration • Emissions from heavy equipment machinery and construction vehicles			
Construction Stage					
Orientation for contractor and workers	• People	• Awareness of workers on the environmental requirements and their responsibility • Understanding of EPC Contractor(s) of their responsibility in implementing the EMP	• Conduct briefing of EPC Contractor(s) on EMP, records management, and reporting • Identify critical areas to be monitored and the required mitigation measures • Create awareness of sexually-transmitted diseases such as HIV/AIDs	Included in the costs of EPC Contractor(s)	EPC Contractor(s), PMUs of DISCOM-W Environmental staff/consultant in PMU
Prepare construction management workplan	• People • Land • Air • Water • Waste	• Avoid effects of EPC Contractor(s) unplanned activities • Smooth work implementation	• Temporary pedestrian and traffic management plan • Community and safety plan • Spoils disposal plan • Noise and dust control plan • Drainage and storm water management plan • Materials management plan • Construction waste management plan	Included in the costs of EPC Contractor(s)	EPC Contractor(s), PMUs of DISCOM-W Environmental staff/consultant in PMU

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
Hiring of project staff and workers	• People	• Conflict due to potential workers" migration • Lack of local support to the project • Dispute over transparency of hiring	• EPC Contractor(s) will be required to use local labour for manual work and eligible local workforce for clerical and office jobs	---	EPC Contractor(s), PMUs of DISCOM-W Environmental staff / consultant in PMU
Presence of workers at construction sites	• People	• Increase in demand for services such as food, temporary housing, etc. • Create opportunities for small-scale business to provide services such as food, temporary housing, etc.	• None required	---	---
• Site preparation, vegetation and land clearing for substations and Distribution line right-of-way (ROW) • Construction of	• People	• 33/11 kV substations (40 sites) & 11 KVA & LT distribution lines	• Construction management plan will be strictly implemented • Use of proper safety clothes/equipment in dismantling structure(s) and equipment • Debris/dismantled structures/equipment will be disposed of in designated landfill and/or controlled dumpsites • Usable scrap materials from dismantling will be stored in warehouses of DISCOM-W in Indore for resale/auction	Included in the costs of EPC Contractor(s)	EPC Contractor(s), PMUs of DISCOM-W Environmental staff / consultant in PMU

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
substations, installation of required equipment at substations, erection of Distribution poles and stringing of conductors		• Potential safety risks to community	• Provide fence or barricade (as appropriate), sufficient lights, clear warning signs and danger signals, and take all precautions identified in the community and safety plan • Assign security personnel to prevent accidents, trespassing, and pilferage • EPC Contractor(s) to direct drivers to strictly follow road regulations		
		• Interference with road crossings	• Danger and clearly visible warning signs will be posted at designated sites • Scaffoldings will be placed over road crossing points • Construction vehicles to strictly follow road regulations • Implement temporary pedestrian and traffic management plan		
		• Potential health and safety risks to workers	• Provide sanitary facilities and wash areas • Provide safe drinking water and garbage bins • Enforce good housekeeping at all times • Provide workers with hard hat, safety shoes and belts • Coordinate with nearest hospital for arrangements in case of accidents • Assign nurse or medical staff to make weekly rounds at substation sites • Set up first aid treatment within construction sites and field office • Observance and compliance with relevant safety measures required by law and best		

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
			engineering practices • Provide communication devices to designated workers		
	• Land and vegetation	• Erosion and localized flooding (e.g., 33/11 kV substation) • Loss of habitat and some mature trees of economic value such as teak (e.g., 132/11 kV substation)	• Compensation for temporary damages to crops/plants along the ROW and substations • Cut trees owned by the government will be sold and revenue turned over to Revenue Authority • Only minimal vegetation will be cleared since most of the substation sites are grassland/shrubland (e.g.) • Landscaping/replanting of trees at new subs-stations will be done after completion of construction works • Erosion-control measures will be provided (as needed) • Implement spoils disposal plan and construction waste management plan		
	• Water	• Generation of sewage from construction workers • Localized flooding • Increase turbidity in surface water near construction sites	• Avoidance of waterways in site selection • Provide sanitary facilities to workers and safe drinking water • Construction works will done during summer in areas potential for erosion and localized flooding • Implement drainage and stormwater management plan • Waterways were avoided in selecting subproject sites		

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
	• Air	• Heavy equipment and construction vehicles may increase vehicular emissions • Transport of construction materials to constructions sites may increase dust level • Earthmoving works, excavations, and opened land areas for substations and poles may increase dust levels • Increase in noise level and vibration from excavation and heavy equipment and construction vehicles	• Construction vehicles will be maintained to minimize vehicular emissions • Enclose construction sites temporarily to contain dust dispersion • Warehouse for construction materials onsite will be provided to reduce trips of material delivery • EPC Contractor(s) will be required to maintain construction vehicles and heavy equipment machineries regularly to reduce emissions • Opened land areas or sources of dust will be sprayed with water (as needed) • Transport of dust-generating materials will be covered • Observance of low speed by vehicles to reduce noise • Noise-generating works will be done between 7AM and 7PM done at daytime as required by EPA act 1986 & amendments. • Construction sites will be covered with acoustic screens and machineries will be temporarily enclosed to control noise (MPPCB guidelines, February 2013) • Require EPC Contractor(s) to maintain and tune-up construction vehicles to reduce noise and no blowing of horns • Observe/comply with traffic management plan		
Operation and Maintenance Stage					

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
Use of mineral oil for transformers	• Land • Water	• Accidental spillage that would contaminate land and water	• Provision of oil-water separator • Provide for oil containment structure	Included in the O & M costs of Project	MP-DISCOM-W
	• People	• Occupational health risks to workers due to exposure	• Acceptance of mineral oil should be accompanied with Material Data Safety Sheets and/or be certified that it is PCB-free • Fire extinguishers readily available in storage areas for mineral oil		
Presence of substations, power Distribution and distribution lines	• Land	• Depreciation of land property values adjacent to substations and power Distribution poles	• Availability of stable and reliable power will trigger economic development in the area	---	---
	• People	• Hazards such as electrocution, lightning strike, etc. due to accidental failure of power Distribution and distribution lines	• Provide security and inspection personnel to avoid pilferage and vandalism of equipment and lines • Appropriate grounding and deactivation of live power lines during maintenance work • Designed with protection system that shuts off during power overload or similar emergencies • Maintain and comply with electrical standards • Distribution lines entering and leaving the substations are insulated (or covered) to minimize impacts • Regular monitoring and maintenance to ensure safety and integrity of power lines and substations	Included in the O & M costs of Project	MP - DISCOM-W

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
			• Conduct information and education campaign to local people to enhance awareness on safety practices of living near substations		
		• Accident working in elevated position	• Implement safety plan to reduce risks • Provision of safety belts and other working gears for protection	Included in the O & M costs of Project	MP-DISCOM-W
		• Potential exposure to electric and magnetic fields (EMF)	• EMF levels expected to be way below the limits set by International Commission on Non-Ionizing Radiation Protection(ICNRP) which is 4.17 kV/m for electric field and 833 mG for magnetic field • Spot measurements of EMF • Substations will be fenced and security staff assigned to prevent unauthorized public access • Information and education campaign will be conducted to local people to create awareness on safety practices	Included in the O & M costs of Project	MP-DISCOM-W
		• Generation of employment	• More than 80 positions will be created during the operation	---	MP-DISCOM-W
	• Noise	• Disturbance to settlements near the substations	• Periodic maintenance of equipment such as transformers and capacitors to minimize noise generation • Provide enclosure of noise-generating equipment • Monitor ambient noise levels	Included in the O & M costs of Project	MP-DISCOM-W

TABLE E.2 ENVIRONMENTAL MONITORING PLAN

Project Stage	Parameter/Indicator	Location	Method of Measurement	Frequency	Responsibility (Implementation and Supervision)
Pre-Construction and Planning	Guaranteed noise level of equipment and machineries	Substation sites	Machinery and equipment specifications – compliance to ambient noise levels	Once	PMUs of MP DISCOM-W
	Soil quality	Substation sites and Distribution Poles	Sampling and chemical analysis	Once	PMUs of MP DISCOM-W
	Quality of transformer oil	Substations sites	Material Safety Data Sheet – compliance to IS:1866	Once	PMUs of MP DISCOM-W
	Loss of terrestrial and aquatic habitat	Substation sites	Ocular inspection, transect survey	Once	PMUs of MP DISCOM-W
	Proximity to water resources	Substation sites and distribution ploes	Ocular inspection, maps	Once	PMUs of MP DISCOM-W
	Routes of migratory birds	Substation and distribution poles	Ocular survey/observation, secondary data	Quarterly to capture seasonal variations	PMUs of MP DISCOM-W
Construction	Local recruitment of workers and staff	Substations, distribution lines, stringing of conductors	Number of local workers and staff recruited	Monthly	PMUs of MP DISCOM-W; EPC Contractor(s)
	Orientation of Contractor(s) and workers on issues like HIV/AIDS, compliance to EMP, etc.	Substations, distribution lines, stringing of conductors	Number of participants	Once before construction,	PMUs of MP DISCOM-W; EPC Contractor(s)
	Spraying of water to opened land areas before movement of construction vehicles	Substations and road easements affected by delivery of equipment and construction material; distribution poles (if needed); stringing of	Ocular inspection/spot checks	• Weekly at road easements (or as needed) • Every day at	PMUs of MP DISCOM-W; EPC Contractor(s)

Project Stage	Parameter/Indicator	Location	Method of Measurement	Frequency	Responsibility (Implementation and Supervision)
		conductors		substation sites during dry season	
	Solid waste management	Substations, workers‟ camps, stringing of conductors, distribution poles	Ocular inspection/spot checks	Every week	PMUs of MP DISCOM-W; EPC Contractor(s)
	Danger and warning signs for safety of workers and the public	Substations and road easements affected by delivery of equipment and construction material; distribution poles; stringing of conductors	Ocular inspection/spot checks	Once a month	PMUs of MP DISCOM-W; EPC Contractor(s)
	Announcement to the public of works schedule	Substations; along the road easement affected by interconnections of distribution lines, poles, and stringing of conductors	Work schedule log sheet	As needed	PMUs of MP DISCOM-W; EPC Contractor(s)
	Erosion control measures such as silt traps	Substations, distribution poles	Ocular inspection	Once a month	PMUs of MP DISCOM-W; EPC Contractor(s)
	Smoke belching construction vehicles	Substations, tdistribution poles, and stringing of conductors	Ocular inspection/spot checking	Weekly	EPC Contractor(s), Environmental Staff of MP DISCOM-West-PMU
	Ambient Air Quality & Noise Level Monitoring	Within Substation premises.	Monitoring through MoEF approved Environmental Laboratories	Half Yearlly till completion of project.	PMUs of MP DISCOM-W; EPC Contractor(s)
	Housekeeping	Substations, distribution lines, workers‟ camps	Ocular inspection/spot checks	Weekly	PMUs of MP DISCOM-W; EPC Contractor(s)

Project Stage	Parameter/Indicator	Location	Method of Measurement	Frequency	Responsibility (Implementation and Supervision)
Operation	Failure of Distribution poles and/or distribution lines	Along the alignment	Maintenance log sheet	Monthly	MP DISCOM-W
	Ambient Air Quality Monitoring	Within Substation premises.	Monitoring through MoEF approved Environmental Laboratories	Annually	PMUs of MP DISCOM-W; EPC Contractor(s)
	Occupational health, and safety	Substations, distribution lines	Number of accidents and/or injuries	Semi-annually	MP DISCOM-W
	Tree planting, maintenance of green landscape	Substations	Ocular inspection	Quarterly	MP DISCOM-W
	Housekeeping	Substations	Spot checks	Monthly	MP DISCOM-W
	Collection of waste (i.e., oil, garbage, etc.)	Substations	O & M log sheet	Monthly	MP DISCOM-W
	Bird collision / electrocution	Along the distribution poles and disribution alignment	Spot checks/oservation	Monthly	MP DISCOM-W
	Pilferage of cables	Along distrubtion poles and distribution lines	Ocular inspection; O&M log sheet (security operations)	Quarterly	MP DISCOM-W

CHAPTER

1. INTRODUCTION

1. To improve the quality and reliability of service in the power Distribution and distribution system networks, the Government of Madhya Pradesh (GoMP) has taken initiatives to invest in the power sector with funding from development partners like the Asian Development Bank (ADB). The investments involve expansion, upgrading and reconfiguration of the existing power Distribution and distribution networks. A Distribution company and three distribution companies involved in the power Distribution and distribution service in Madhya Pradesh (MP) as a result of restructuring the Madhya Pradesh State Electricity Board (MPSEB) in 2005[2] . The MPSEB was dissolved on 26 April 2012. The Madhya Pradesh Power Management Company Ltd. (MPPMCL, previously known as Madhya Pradesh Power Trading Company) is the holding company of the three distribution companies (DISCOMs).

2. The Madhya Pradesh Paschim Keshtra Vidyut Vitaran Co. Limited (MPPKVVCL) as power distribution company-DISCOM-W serves as the executing agency (EA) as well as implementing agency (IA) for the project. MPPKVVCL-DISCOM-West has established project management units (PMUs) for implementing the project in Indore & Ujjain region. Figure-1.1 shows jurisdiction of DISCOM West:

Figure-1.1- MP DISCOM-West Jurisdiction

[2] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).

1.1. Overview of the Project

3. The peak availability in the MP power sector was 9,692 megawatt (MW) while the estimated unrestricted peak demand was 10,308 MW resulting in an unmet demand of 616 MW in fiscal year (FY) 2012. Expansion of the distribution system with new power connections to households, increased consumption from existing customers, and the rapid economic growth of the state[3] are expected to rapidly increase the demand for electricity. Demand for electricity grew at about 13.42% per annum during FY 2010-2012 and is predicted to grow over 11% per annum between FY2013-2017. By 2017 Distribution and distribution system should deliver about 7000 MW of additional power to the customers. An estimated 20% demand supply gap may result by FY 2017-18, if the Distribution and distribution (T& D) capacity is not enhanced. Therefore, the proposed investments in T& D aim removing the existing bottlenecks and expansion of the T&D capacity to meet the growing demand.

4. The distribution system is still in growth phase and currently needs strengthening to meet the growing demand in the various regions. The state has set ambitious target of 24 hour power supply to households. In order to achieve this objective three major programs are in implementation: i) Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY), program aimed at providing 1.8 million new household connections; (ii) The Restructured Accelerated Power Development Reforms Program (R-APDRP), to improve electricity distribution infrastructure in urban areas; and (iii) Feeder Separation Program to limit agricultural supply to 8 hours and to provide rural households with 24 hour power supply. On the supply side, the capacity additions are likely for both the state owned utilities and the Independent Power Producers (IPPs) which are proposed to come up in the state as a consequence of its successful IPP policy. The state will also have its share in the central sector generating stations. The capacity addition target is around 9,700 MW by FY 2018 to meet the growth in the future demand. Madhya Pradesh (MP) is predicted to have generation surplus from FY 2014 onwards.

5. The distribution companies have not been able to make profits mainly due to high technical and commercial losses. The cumulative state aggregate technical and commercial (AT&C) losses for the distribution system has come down from 39.52% in FY 2009 to currently 27.1% in FY 2013. By FY 2016, the targeted AT&C loss for the state would be around 17.3%. In order to achieve the FY 16 target of AT&C loss

[3] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).

reduction as well as to cater to the growing demand, the three distribution companies in MP have identified investments in various projects worth $2,600 million during the period FY 2013 to FY 2017. The ongoing RGGVY, R-APDRP and Feeder Separation programs partially meet this requirement. The proposed project supports some selected distribution improvements included in Distribution Companys" (DISCOMs) five year plans.

6. The Project has distribution system improvement project & capacity building for the DISCOM-West. The executing agencies (EAs/IAs) for the project will be MP Paschim Keshtra Vidyut Vitaran Co Limited- DISCOM-West, Indore (MP). The distribution system improvement component in respect of DISCOM-West will include the construction of new 33/11 kV substations, bifurcation of overloaded 33 kV feeders, additional/ augmentation of power transformers, installation of distribution transformers and capacitor banks.

7. A combined IEE report for all distribution companies & power Distribution were submitted for ADB"s approval in September, 2013. However, during the course of progress of the works, there were location changes in some substations, further some distribution lines were also added to the same project and some were dropped as they were no longer necessary. In case of substations, eight substations were changed site location from the original scope of work. In light of these changes, refer table no-3.1, the IEE report is updated in January 2018 to reflect site location changes and also to incorporate the new scope of 100 KVA DTR & associated 11 KV & LT distribution lines for DISCOM-West jurisdiction covering Indore & Ujjain regions.

1.1.1. Impact and Outcome

8. The impact of the project would be adequate and reliable power supply for sustainable growth of power sector of MP. The project outcome would be increased capacity and improved operational efficiency in electricity Distribution and distribution system in MP.

1.1.2. Outputs

9. The outputs for the distribution system improvement component include the construction of new 33/11 kV substations, bifurcation of overloaded 33 kV feeders, addition/augmentation of power transformers, installation of distribution transformers and capacitor banks. A total of 40 nos new 33/11 kV substations are proposed to be constructed and including 100 KV & LT distribution lines to consumer ends.

10. The outputs for the capacity building component for the executing agency (EA) staff in MP DISCOM-West. Training will include induction training for new staff, and training on

new technology, project management, procurement, monitoring and evaluation, financial management, and safeguards for existing staff. Ten trainers and 15 to 20 EA staff will be trained with the support of the project.

1.1.3. Financing Plan and Implementation Arrangement

11. The financing plan of the project is given in Table 1.1.

Table 1.1- Financing Plan of DISCOM - West

Finance Source	**Amount** INR-Cr	**Share of Total** (%)
Asian Development Bank	204.96	77.15
Ordinary capital resources (loan)		
Government (DISCOM-West)	60.71	22.85
Total	**265.67**	**100.0**
Source: Disom-West- September 2017		

12. MP-DISCOM-West is the executing agencies (EA) and at the same time, implementing agencies. A project management unit (PMU) has set up within executing agency / implementing agency. The MP Department of Energy will provide the supervision and coordination of project activities implemented by the DISCOM-West. Figure 1.2 shows the indicative implementation arrangement of DISCOM-West

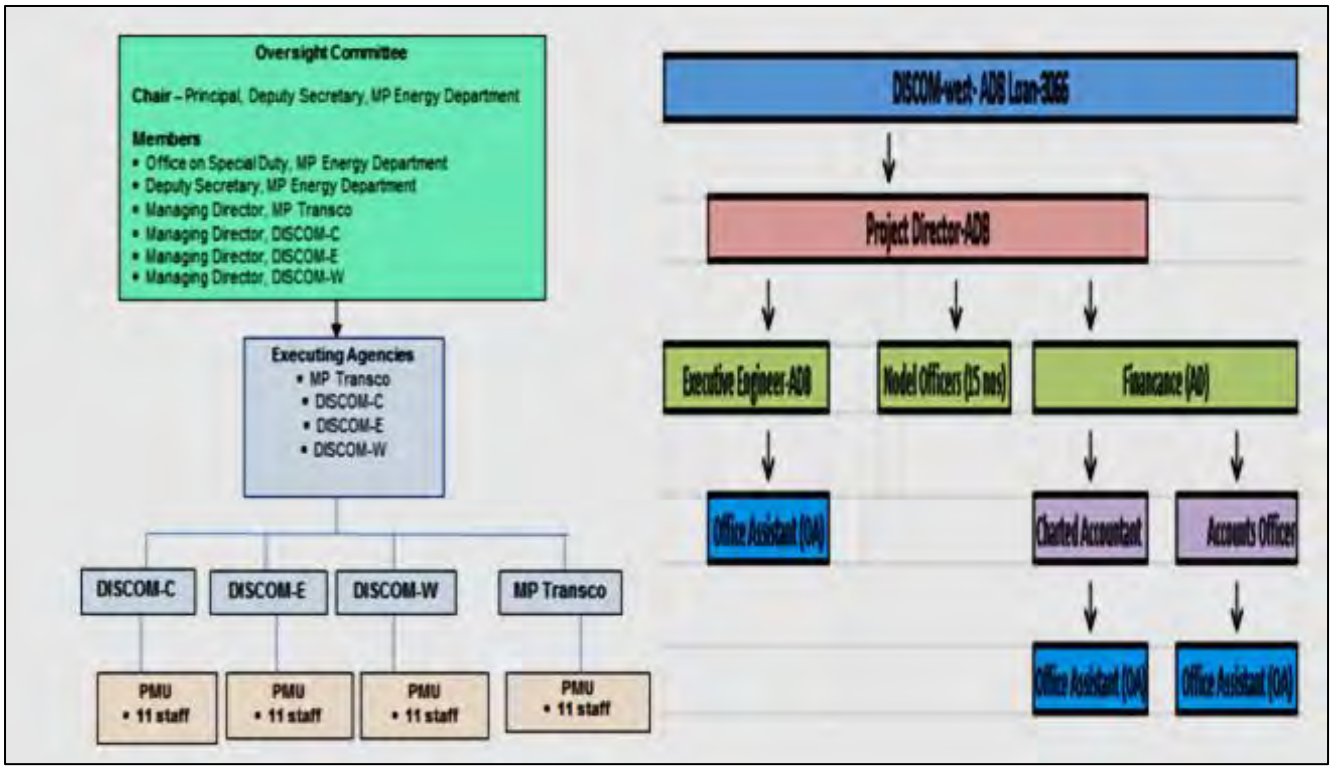


Figure 1.2 Indicative Project Implementation Arrangements

1.2. The Need for an Initial Environmental Examination

1.2.1. National Requirements

13. The Government of India (GoI) considers power Distribution projects as environment-friendly compared to other power development projects since they do not generate and dispose of hazardous waste to land air and water, thus, they are not included within the realm of the Environment Protection Act 1986. In September 2006, the Ministry of Environment and Forests (MoEFCC) has issued a notification exempting power Distribution projects from environmental clearances due to its non-polluting nature.[4] Therefore, no environmental clearances for the proposed project will be required from the MoEFCC or from the Madhya Pradesh State Pollution Control Board (MPPCB).

14. However, under the Forest Conservation Act 1980, if power Distribution projects will traverse or affect land classified as forest by GoI, forest clearance has to be obtained from the relevant authorities to prevent deforestation and degradation. The MP state government cannot de-classify any forest land or authorize its use to any non-forest purpose without the approval of the Central government. Given this stringent requirement, avoidance of land designated as forest by GoI has been included as one of the main criteria for site selection in power Distribution and distribution projects.

1.2.2. Requirements of Asian Development Bank

15. The Safeguard Policy Statement 2009 (SPS 2009) of ADB sets out the requirements for environmental safeguard that applies to all ADB-financed projects.[5] Under SPS 2009, projects that require financing from ADB are screened and categorized based on their potential environmental impacts. This project is classified by ADB as Category B on environment requiring the preparation of an initial environmental examination (IEE). Following the requirements of SPS 2009, this updated IEE is prepared covering the components of the proposed project & changes of DISCOM-West, since submission of the previous combined IEE report of September 2013 on construction of new 33/11 KVA substation & distribution system lines.

1.2.3. Objectives of the IEE

16. The objectives in undertaking an IEE are:

    (i) to assess the environmental impacts – positive and negative associated with the proposed project;

[4] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).
[5] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).

(ii) to identify the corresponding mitigation and/or enhancement measures for the environmental impacts; and,

(iii) to ensure that all statutory requirements for the project such as applicable rules and regulations, clearances required (if any), etc. have been considered to ensure compliance.

1.2.4. Scope and Methodology

17. The scope of the IEE covers the general environmental profile of western MP, an assessment of the potential environmental impacts on physical, ecological, economic, and social and cultural resources within the project‟s influence area during design and/or pre-construction, construction, and operation stages. An environmental management plan and an environmental monitoring plan are integral part of the IEE. The IEE followed a number of steps:

- Conduct field visits to collect primary or secondary data relevant to the project area to establish the baseline environmental condition;
- Assess the potential impacts on environmental attributes due to the location, design, construction and operation of the Project through field investigations and data analysis;
- Explore opportunities for environmental enhancement and identify measures;
- Prepare an environment management plan (EMP) outlining the measures for mitigating the impacts identified including the institutional arrangements;
- Identify critical environmental parameters required to be monitored subsequent to the implementation of the Project and prepare an environmental monitoring plan;
- Compare the environmental safeguard requirements of GoI, GoMP and ADB, and identify measures to bridge the gap, if any;
- Carry out consultation with affected stakeholders, local administrative bodies to identify perception of the Project, introduce project components and anticipated impacts; and,
- Disclose the updated IEE at ADB website and prepare project brief and/or FAQs in local language to be made publicly available at the offices of DISCOM-W.

18. Earlier field visits were done between July 22 to July 26, 2013 & further updated in January 2018 to conduct ocular inspection and to assess the existing condition of the physical and biological environment of selected subproject sites, consult with local

people that may be potentially affected by the subprojects, coordinate with DISCOM-W; and local authorities, and to conduct secondary data collection.

1.3. Structure of the Updated Report

19. In line with SPS 2009, the IEE report has the following contents:

- Executive Summary: This section briefly describes the critical facts, significant findings, and recommended actions.
- Introduction (Section 1.0): Describes the overview of the project, environmental requirements, objectives and scope of the study, approach and methodology.
- Policy, Legal, and Administrative Framework (Section 2.0): Discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the GoI is a party or signatory, and other requirements relevant to the proposed project such as no objection certificate, consent/permission from concerned departments and/or organizations, as applicable.
- Description of the Existing Environment (Section 3.0): Describes the relevant physical, biological, and socioeconomic conditions within Madhya Pradesh as the subprojects covered in the proposed project are spread all over the state
- Project Description(Section 4.0): Provides an overview of the proposed project; its objectives and major components including maps showing the project‟s location
- Analysis of Alternatives (Section 5.0): Examines the alternatives to proposed project sites to ensure avoidance of significant adverse environmental impacts
- Anticipated Environmental Impacts and Mitigation Measures (Section 6.0): Provides an assessment of the associated environmental impacts and corresponding mitigation measures. The environmental impacts and mitigation measures including the environmental monitoring are summarized in the environmental management plan and environmental monitoring plan.
- Information Disclosure, Consultation, and Participation (Section 7.0): Describes the process of engaging stakeholders and information disclosure. This section summarizes the comments and concerns of affected persons.

- Grievance Redress Mechanism (Section 8.0): This section describes the grievance redress framework and setting out the time frame and mechanisms for resolving potential complaints and/or issues from affected persons.
- Environmental Management Plan & Institutional Set up (Section 9.0): Describes the set of mitigation and management measures to be taken for each identified environmental impact during project design, construction and operation. This section also includes monitoring and reporting procedure as well as institutional implementation arrangements.
- Environmental Due Diligence (Section 10.0): Describes the residual environmental impact due to changed/ updated scope of works and time bound corrective measures, if any.
- Conclusion and Recommendation ((Section 11.0): Describes the findings & outcome of report. This section also includes benefits & impacts.

CHAPTER

2. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. ADB Safeguard Policy Statement 2009

20. ADB requires the consideration of environmental issues in all aspects of its operations, and the requirements for environmental assessment are described in its Safeguard Policy Statement 2009 (SPS 2009).[6] This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, and loans involving financial intermediaries, and private sector loans.

21. Screening and Categorization. The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project, the sensitivity, scale, nature and magnitude of its potential impacts, and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts are assigned to one of the following four categories:

    (i) **Category A**. Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
    (ii) **Category B**. Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
    (iii) **Category C**. Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
    (iv) **Category FI**. Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all Projects will result in insignificant impacts.

22. REA checklist has been prepared to support environment classification as catyegory-B with respect to updated scope of work of DISCOM-West under ADB loan-3066, which has been presented in Appendix -I.

[6] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).

2.2. Applicable National and State Legislation

23. The implementation of the project and subprojects will be governed by the GoI and GoMP[7] environmental acts, rules, regulations, and standards. These regulations impose restrictions on activities to minimize and/or mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure subprojects are consistent with the policy, legal and administrative framework across all hierarchy - national, state municipal and local.

24. Some of the applicable national and state acts/rules applicable to this project are as follows and details given in Appendix -II. Compliance with legislations (acts/rules) is mandatory at all stages of project implementation.

    (i) The Hazardous Wastes (Management and Handling) Amendment Rules, 2003
    (ii) Batteries (Management and Handling) Rules, 2001
    (iii) ORegion Depleting Substances (Regulation and Control) Rules, 2000
    (iv) The Environment (Protection) Act, 1986, amended 1991 and including Rules/Notification issued under this Act.
    (v) The Biodiversity Act, 2002

2.3. National and State Environmental Assessment Requirements

25. As per GoI"s Environment Impact Assessment (EIA) Notification 2006, power Distribution (and distribution) projects **are not listed as environmental sensitive projects and hence no environmental clearance** is required from MP State Pollution Control Board (MPSPCB)[8] or the Ministry of Environment and Forests (MoEFCC)[9]. Clearance from MP Forest Department is required only in cases where subproject is constructed on forestland or requires cutting of forest trees. Figure 2.1 shows the process of obtaining an environmental clearance in India.

[7] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).
[8] Ibid 8.
[9] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006)

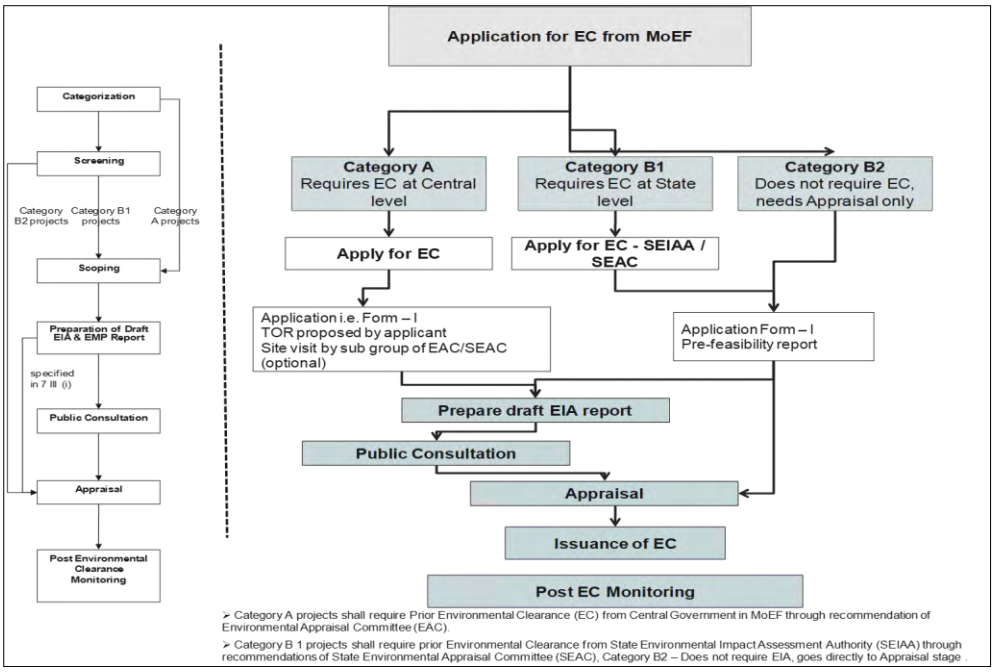


Figure 2.1 Environmental Clearance Process in India

26. The MoEFCC, GoI, vide its Notification Nos. S.O. 1533 dated September 14, 2006, reengineered the EIA process in India, also decentralized some powers, and made provision to constitute the State Level Environment Impact Assessment Authority (SEIAA) and the State Level Expert Appraisal Committee (SEAC) for performing functions under the said Notification.

27. In MP, the central Government constituted the State Level Environment Impact Assessment Authority (SEIAA) in the pursuance of the GoI notification on 1533(1) dated 14 September 2006. The SEIAA, MP bases its decision on the recommendations of the State Level Expert Appraisal Committee (SEAC) also constituted for MP as per the order. [10]

28. Table 2.1 presents a comparison of the environmental requirements of ADB and GoI.

Table 2.1 Comparison of Environmental Requirements of ADB and GoI

Project Stage	ADB	GoI	Gaps
Screening and Categorization	• Uses sector-specific rapid environmental assessment checklist for screening • assigns categories based on potential impacts: • A - EIA required (irreversible, diverse or	• EIA Notification (2006; 2009) set screening criteria to classify new and expansion projects based on potential environmental impacts as follows:	• As per the Indian regulations, the environment impact assessment (EIA) is *mandatory* for eight types of project activities including mining,

[10] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).

Project Stage	ADB	GoI	Gaps
	unprecedented adverse environmental impacts) • B - IEE required • C - no environmental assessment required but a review of environmental implications is required • FI - ESMS required	Category A, B1 and/or B2. • The category determines the level of environmental assessment.	power generation, primary processing, materials production and processing, specific manufacturing and services sectors, infrastructure and construction. Under each category, the threshold limits are specified when it is mandatory to conduct an EIA. • Power Distribution (and distribution) projects are not listed as environmental sensitive projects.
Environmental Assessment	• Identify potential impacts on physical, biological, physical cultural resources, and socioeconomic aspects in the context of project's area of influence (i.e., primary project site and facilities, and associated facilities)	*Category A* - • Require Prior Environmental Clearance (EC) from Central Government in the MoEFCC through recommendation of Environmental Appraisal Committee (EAC). *Category B* – • Category B 1 projects require prior Environmental Clearance from State Environmental Impact Assessment Authority (SEIAA) through recommendations of State Environmental Appraisal Committee (SEAC), *Category B2* – • Does not require EIA, goes directly to Appraisal stage.	• Power Distribution (and distribution) projects are not listed as environmental sensitive projects. • In such cases, however, to comply with the SPS (2009), an environmental assessment needs to be carried out.
Analysis of	For projects with potential	• Compares feasible	• Under the National

Project Stage	ADB	GoI	Gaps
Alternatives	significant impacts (i.e., Category A) • Examine alternatives to the project's location, design, and technology • Document rationale for selecting the particular project location, design, and technology • Consider "no project" alternative	alternatives to the proposed projects site, technology, design and operation including the "without project" situation in terms of their potential environmental impacts, the feasibility of mitigating these impacts, their capital and recurrent costs, their suitability under local conditions and abatement.	Law, Distribution projects have the "right of way" • In such cases, however, to comply with the SPS (2009), and analysis of alternatives needs to be carried out.
Meaningful Consultation	• Starts early and continues during implementation • Undertaken in an atmosphere free of intimidation • Gender inclusive and responsive • Tailored to the needs of vulnerable groups • Allows for the incorporation of all relevant views of stakeholders	• Public consultation required to be undertaken through public notice prior to the approval by the MoEFCC only for Category B1 and A projects. • Starts at a later stage in the project cycle	• There are no major gaps. However the public consultation starts at a later stage in the project cycle.
Information Disclosure	ADB will post in its website the following: • Draft EIA report posted on ADB website at least 120 days prior to Board consideration • Draft EA/EARF prior to appraisal • Final or updated EIA/IEE upon receipt • Environmental monitoring report submitted by borrowers upon receipt	• Information disclosure required to be undertaken through public notice prior to the approval by the MoEFCC only for Category B1 and A projects.	• No major gaps
Grievance Redress Mechanism	• Establish a mechanism to receive and facilitate resolution of grievances or complaints	• Grievance redress mechanism is not mentioned in the regulations	• Major gap. • To comply with the SPS 2009, a mechanism for redressal will be set

Project Stage	ADB	GoI	Gaps
			up.
Use of Environmental Standards	• Refers to Environmental Health and Safety Guidelines (EHS) 2007 • If national regulations differ, more stringent will be followed • If less stringent levels are appropriate in view of specific project circumstances, provide full and detailed justification	• The Environment (Protection) Rules, 1986 • Various legislations addressing aspects such as air and water pollution, hazardous substance management, etc. • Occupational health and safety standards included in the Factories Act (India) and various India specific Labor Laws	• The limiting value of some pollutants specified in the Indian regulatory standards maybe different than those specified in EHS 2007 guidelines and hence some gaps in certain situations.
Monitoring and Reporting	• Prepare monitoring reports on the progress of EMP • Retain qualified and experienced external experts or NGOs to verify monitoring information for Category A projects • Prepare and implement corrective action plan if non-compliance is identified • Requires submission of quarterly, semiannual, and annual reports to ADB for review	• Post environmental clearance (EC) monitoring is stipulated by the regulations, with half yearly compliance reports to be made available as public documents. • Latest report displayed on website of regulatory authority	• .No major gaps

2.4. Applicable International Environmental Agreements

29. International conventions such as the International Union for Conservation of Nature and Natural Resources (IUCN)[11], Convention on Migratory Species (CMS) [12], Convention on Wetlands of International Importance (Ramsar Convention) [13], Convention on Biological Diversity (CBD) [14], and Stockholm Convention on Persistent Organic Pollutants (POPs) [15] are applicable for selection and screening of subprojects under restricted and /or sensitive areas. India is a party to these conventions as detailed in Appendix -III.

[11] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).
[12] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).
[13] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).
[14] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).
[15] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).

30. For the subprojects, (i) animals and plant species found in the subproject sites are not included in the IUCN Red List; (ii) will not alter bird migration; (iii) sites are not within or adjacent to wetlands, protected or forest areas; and (iv) does not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

31. Subprojects may be subject to Stockholm Convention on Persistent Organic Pollutants (POPs) as per Article 3 and Annex A of the Convention and shall subscribe to the provisions set forth under the Convention.

2.5. Other Applicable Laws and Policies

32. According to the Child Labor Act[16] adolescents between the ages of 14 to 18 years, if employed, shall not be engaged in hazardous working conditions. The national and state laws cover the occupational health and safety of employees working only in factories and mines. However, the Indian Constitution stipulates provisions to ensure that the health and well-being of all employees are protected and the state has the duty to ensure protection. The project will ensure compliance to applicable core labour standards of ADB-ILO during design and implementation. [17]

[16] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).
[17] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).

CHAPTER

3. PROJECT DESCRIPTION

3.1. Introduction

33. MP Paschim Keshtra Vidyut Vitaran Co Limited, Indore is executing agency (EA) for the projects under DISCOM-West for distribution system improvement for Indore & Ujjain circle. They currently serve about 3.75 million customers within an area of 77,021 km^2 in the rural and urban areas. The objective of the project is to strengthen and modify existing 33 KV and 11 KV network including construction of 33/11 KV substations of all 14 Districts of DISCOM-West.

34. DISCOM-West area hires distribution transformer for irrigation normally, during Rabi season Group of cultivators. They install distribution transformer online to the 11 KV Feeders during this process Lot of time is consumed .So to overcome this situation It is decided to Install Permanently 100 KVA 11/0.4 Star rated Distribution Transformer in place of temporary rental Distribution Transformer and Convert Temporary connection into permanent connections.

35. To implement this project district wise sub projects are prepared for strengthening and modification of present electrical network and work is planed to be awarded to different competent vendors so that entire project can be completed within the time limit.

3.2. Objective & Benefits

36. In accordance to the provisions of „Sankalp **2013''** objective is to made for 24 hours electric supply to rural light and fan and other consumers except Agriculture irrigation consumers to whom 10 hours continuous electric supply is to be ensured .Provision is to done to manage the load growth and simultaneously it is to be ensured that line losses should not be beyond prescribed limits.

37. The To overcome this situation it is decided to have separate electric supply feeders for habitant areas of villages so that they may be provided 24 hours electric supply being small percentage of total load, the higher portion of the total load is of irrigation pump sets which may be provides electric supply according to the availability by staggering and load shading.

38. Key benefit of these projects is to provide quality power supply to domestic and other rural consumers which will results in over all development of rural mass. Flattening of load curve will help in reduction of power purchase cost and other penal expenditures. Quality power supply to irrigation consumer will increase production of crops, thereby overall improvement in their financial status. Development of small industries in rural sector due to better and improved availability of power supply. Besides above mentioned direct benefit to the villagers there will be reduction in line loss, Power and Distribution transformer failure, reduction in interruption and increase in consumer satisfaction.

39. Overall, it is expected that the completion of the Distribution system improvement will provide a continuous, more stable and reliable power Distribution capacity networks that is likely to contribute to poverty alleviation through the use of available electricity for agricultural production, tourism, industrialization, business, education, commercial activities, health, and other employment-generation activities.

3.3. Updated Scope of Work

40. Orignial IEE scope of work was constructing New 33/11 KV 5 MVA substation along with 33 KV & 11 KV lines, birfucation of 33 KV feeders including augmentation & additional power transformers alongwith 11 KV line for interconnecting feeders at the time of DPR stages. During the progress of project & survey, 8 nos site location of substations has been changed with respect to originally proposed due to non-avilibility of land. New scopes of 100 KV distribution lines have been planned to project, which will be stringed up to consummers to project activites.

41. IEE has been updated in January 2018 with respect to change of 8 nos new substations location sites in Indore (PPR-41-Lot-I) & Ujjain (PPR-41-Lot-II), including 632.8 km of 33 KVA distribution lines for additional feeder birfurcation and addition of new scope of work for installation of 1221 nos. permanent 100 KVA Distribution Transformers (DTR) in place of Temporary Rental Distribution Transformers and Associated 623 km 11 KV Line & 504 km LT Line on AB Cable in Indore (PPR-42-Lot-I) & Ujjain Region (PPR-42-Lot-II). Updated total scope of work has summarized & shown in Table no- 3.1. Details of updated scope of work of Indore Region & Ujjain Region based on survey, has been provided district wise in Appendix-IV.

Table 3.1 presents the updated summary of the subprojects for DISCOM-West (see **Appendix-IV** for details of subprojects district & Region wise.).

Table 3.1 Summary of Updated Scope of Work of DISCOM-West

Summary of Sub-projects-Discom-West- ADB Loan- 3066								
Description	Unit	P I - 1	P I - 2	SubTotal (PI-1+PI-2)	P II - 1	P II - 2	SubTotal (PII-1+PII-2)	Grand Total
Augmentation of Capacity								
From 3.15 MVA to 5 MVA	Number	51	49	100	-	-	-	100
From 5 MVA to 8 MVA	Number	11	0	11	-	-	-	11
Additional 5 MVA	Number	27	30	57	-	-	-	57
Transformer capacity addition	MVA	262.35	240.65	503	-	-	-	503
Addition of new substations								
33/11 kV substations	Number	22	18	40	-	-	-	40
Capacity	MVA	110	90	200	-	-	-	200
Addition of distribution lines								
33KVA Distribution Line (S/s)	KM	123.5	89.9	213.4	-	-	-	213.4
11KVA Distribution Line (S/s)	KM	75.25	64	139.25	-	-	-	139.25
11KVA Distribution Line (Addl. & Aug)	KM	111.50	89.5	201	-	-	-	201
Additional feeders and distribution transformers								
33 KV Feeder	Number	29	28	57	-	-	-	57
33KVA Distribution Line (Feeder Bifurcation) New Scope	KM	284	348.8	632.8	-	-	-	632.8
100 KVA DTR- New Scope	Number	-	-	-	414	807	1221	1221
11KVA Distribution Line(DTR)- New Scope	KM	-	-	-	210	413	623	623
LT Distribution Line - New Scope	Km	-	-	-	171	333	504	504
Note	P-I-1	PPR-41-LOT-1	Indore Region		P-II-1	PPR-42-LOT-1	Indore Region	
	P-I-2	PPR-41-LOT-2	Ujjain Region		P-II-2	PPR-42-LOT-2	Ujjain Region	

42. All substations are being constructed on Govt land only. Please refer Appendix-V MPPKVVCL-Indore vide circular no 16986, dated 17th September 2010 for allotment of Govt Land to Power Transmission & Distribution compamies of MP state.

3.4. Location & Component:

43. The outputs for the distribution system improvement component total addition of 200 MVA (110 MVA in Indore Region & 90 MVA in Ujjain Region) by constructing new 40 nos 33/11 KVA substation & augmentation of existing substation capacity and associated 33 KV & 11 KV lines including bays at 33/11 KV S/s, DP structure, the focus is to upgrade the distribution capacity at the existing substations. Plese refer proposed substation layout provided in Appendix-VIII. The target is to create more substations to feed the distribution network as shown figure no-3.1, towards improving the overall quality and reliability of supply. Refer table no.3.2 for progress of all substations.

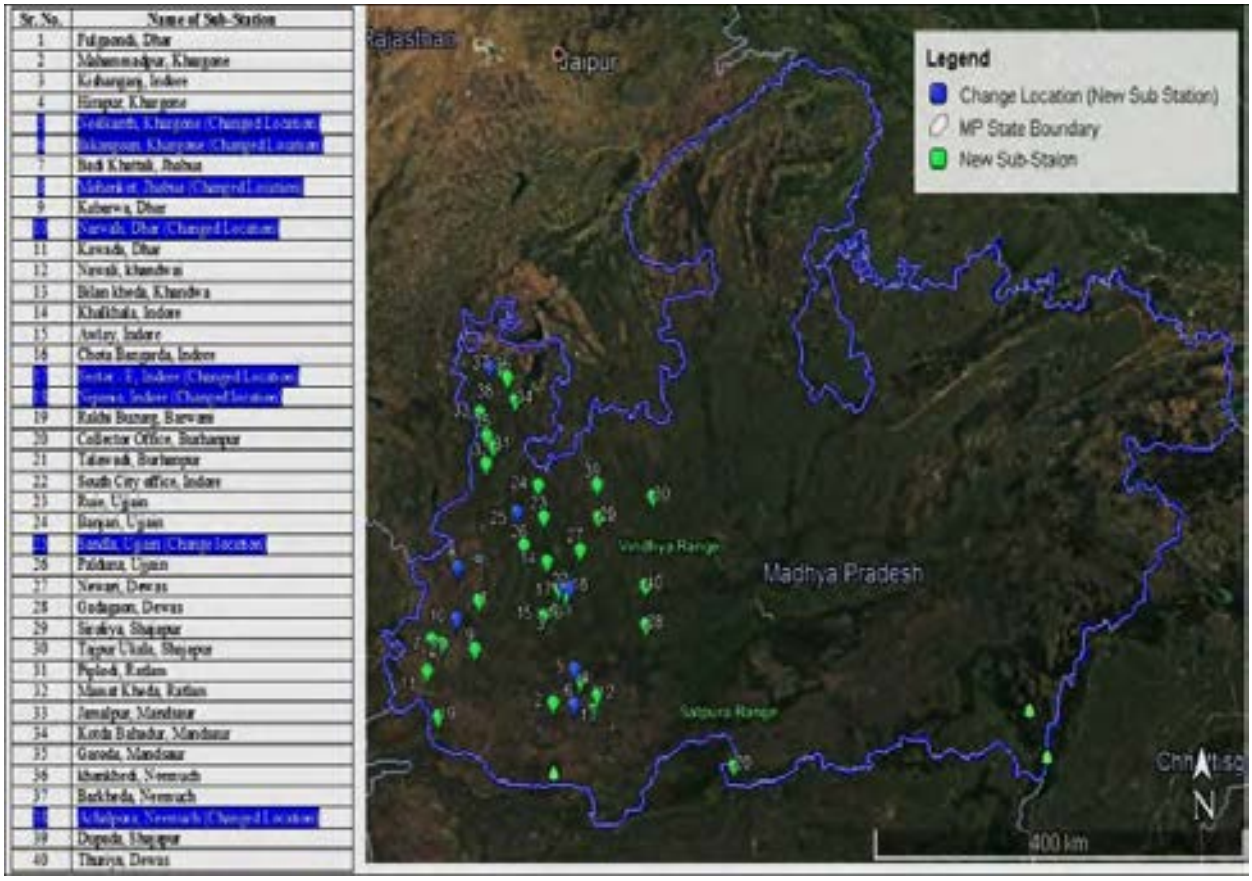


Figure - 3.1. Substation Location Map of DISCOM-West.

44. **Substation name: South Div Office** 33/11 KV- Substation South Div Office 33/11 KV is located in Indore district within city area under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No

trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

45. **Substation name**: **Nipania** 33/11 KV- Substation Nipania 33/11 KV is located in Indore district near to Indore-Mumbai by pass NH-3 under Indore Region. This is changed location by replacing originally planned at IG office-Indore due to non- avilibility of land. This changed location is entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

46. **Substation name: Sector-E** 33/11 KV- Substation Sector-E 33/11 KV is located in Indore district within Sanwer Road Industrial Area under Indore Region. This is changed location by replacing originally planned at Amar Tekri north division due to non- avilibility of land. This changed location is entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

47. **Substation name**: **Chhota Bangarda** 33/11 KV- Chhota Bangarda 33/11 KV is located in Indore district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

48. **Substation name: Avlai** 33/11 KV- Avlai 33/11 KV is located in Indore district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

49. **Substation name: Kisanganj** 33/11 KV- Kisanganj 33/11 KV is located in Indore district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

50. **Substation** name: Khalkhala 33/11 KV- Khalkhala 33/11 KV is located in Indore district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

51. **Substation name: Nawali** 33/11 KV- Nawali 33/11 KV is located in Khandwa district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

52. **Substation name: Bilankheda** 33/11 KV- Bilankheda 33/11 KV is located in Khandwa district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

53. **Substation name: Talawadi** 33/11 KV- Talawadi 33/11 KV is located in Burhanpur district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

54. **Substation** name: Collector Office Town 33/11 KV- Collector office town 33/11 KV is located in Burhanpur district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

55. **Substation name: Mohammadpur** 33/11 KV- Mohammadpur 33/11 KV is located in Khargone district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

56. **Substation name: Hirapur** 33/11 KV- Hirapur 33/11 KV is located in Khargone district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

57. **Substation name: Nilkanth** 33/11 KV- Substation Nilkanth 33/11 KV is located in Khargone district under Indore Region. This is changed location by replacing originally planned at Chitawad due to non- avilibility of land. This changed location is entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

58. **Substation name: Bhangaon** 33/11 KV- Substation Bhangaon 33/11 KV is located in Khargone district under Indore Region. This is changed location by replacing originally planned at Durgapur due to non- avilibility of land. This changed location is entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important

bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

59. **Substation name: Rakhi Bujurg** 33/11 KV- Rakhi Bujurg 33/11 KV is located in Barwani district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

60. **Substation name: Kabarwa** 33/11 KV- Kabarwa 33/11 KV is located in Dhar district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

61. **Substation name: Narwali** 33/11 KV- Substation Narwali 33/11 KV is located in Dhar district under Indore Region. This is changed location by replacing originally planned at Meghapura due to non- avilibility of land. This changed location is entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

62. **Substation name: Kawada** 33/11 KV- Kawada 33/11 KV is located in Dhar district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

63. **Substation name: Phoolgawadi** 33/11 KV- Phoolgawadi 33/11 KV is located in Dhar district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

64. **Substation name: Badikhattali** 33/11 KV- Badikhattali 33/11 KV is located in Jhabua district under Indore Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

65. **Substation name: Mohan Kot** 33/11 KV- Substation Mohankot 33/11 KV is located in Jhabua district under Indore Region. This is changed location by replacing originally planned at Pitolnaka due to non- avilibility of land. This changed location is entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

66. **Substation name: Ruee** 33/11 KV- Ruee 33/11 KV is located in Ujjain district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

67. **Substation name: Banjari** 33/11 KV- Banjari 33/11 KV is located in Ujjain district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the

land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

68. **Substation name: Sandla** 33/11 KV- Substation Sandla 33/11 KV is located in Ujjain district under Ujjain Region. This is changed location by replacing originally planned at Pingleshwar due to non- avilibility of land. This changed location is entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

69. **Substation name: Palduna** 33/11 KV- Palduna 33/11 KV is located in Ujjain district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

70. **Substation name: Thuria (Seti)** 33/11 KV- Thuria (Seti) 33/11 KV is located in Dewas district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

71. **Substation name: Gada Gaon Nimasa** 33/11 KV- Gada Gaon Nimasa 33/11 KV is located in Dewas district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

72. **Substation name**: **Neori Phata** 33/11 KV- Neori Phata 33/11 KV is located in Dewas district under Ujjain Region & entirely on government wasteland. The substation does

not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

73. **Substation name: Siroliya** 33/11 KV- Siroliya 33/11 KV is located in Shajapur district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

74. **Substation name: Tajpur Ukala** 33/11 KV- Tajpur Ukala 33/11 KV is located in Shajapur district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

75. **Substation name: Dharloa** 33/11 KV- Dharola 33/11 KV is located in Shajapur district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

76. **Substation name: Piplodi** 33/11 KV- Piplodi 33/11 KV is located in Ratlam district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

77. **Substation name: Mamatkheda** 33/11 KV- Mamatkheda 33/11 KV is located in Ratlam district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

78. **Substation name: Jamalpura** 33/11 KV- Jamalpura 33/11 KV is located in Mandsaur district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

79. **Substation name: Kothdabahadur** 33/11 KV- Kothdabahadur 33/11 KV is located in Mandsaur district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

80. **Substation name: Garoda** 33/11 KV- Gardoa 33/11 KV is located in Mandour district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

81. **Substation name: Khankhedi** 33/11 KV- Khankhedi 33/11 KV is located in Neemuch district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

82. **Substation name: Barkheda** 33/11 KV- Barkheda 33/11 KV is located in Neemuch district under Ujjain Region & entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

83. **Substation name: Achalpura** 33/11 KV- Substation Achalpura 33/11 KV is located in Neemuch district under Ujjain Region. This is changed location by replacing originally planned at Jaliner due to non- avilibility of land. This changed location is entirely on government wasteland. The substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No religious, historical or ASI recognised sites lie in the proposed substation location. No trees will be cut during substation construction as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the substation location as it comprises of wasteland.

84. **Augmentation of Existing Substation 33/11 KV of Indore Region-** The augmentation of existing substation by total addition of transformer capacity 262.35 MVA in Indore Region. These augmentations of existing substationa transformer capacities are 3.15 MVA to 5 MVA by 51 nos in Indore Region & 5 to 8 MVA in 11 nos in Indore Region. Additional 5 MVA transformer additions are 27 nos in Indore Region. All existing substations are located entirely on government wasteland. The existing substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No trees will be cut during augmentation/ addition of transformer in existing substation. Progress of augmentation of existing 33/11 KV substation of Indore region is 79.77% as on December 2017.

85. **Augmentation of Existing Substation 33/11 KV of Ujjain Region-** The augmentation of existing substation by total addition of transformer capacity 240.65 MVA in Ujjain Region. These augmentations of existing substationa transformer capacities are 3.15 MVA to 5 MVA by 49 nos in Ujjain Region. Additional 5 MVA transformer additions are 30 nos in Ujjain Region. The existing substation does not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary, important bird area etc. No trees will be cut during augmentation/ addition of transformer in existing substation. Progress of augmentation of existing 33/11 KV substation of Ujjain region is 94.93% as on December 2017.

86. **Additional Feeders & Distribution Lines for Substation 33/11 KV of Indore Region**- This is integrated part of scope of project of original IEE report. Additional feeders will be 29 nos in Indore Region. Stringing of of total distribution lines will be 123.5 km for 33 KV (S/s), 75.25 km for 11 KVA distribution lines (S/s) & 111.50 km 11 KVA distribution lines (Addl & Aug) in Indore Region. Here 284 km 32 KVA distribution lines will be additional works for feeder birfurcation, which was not part of original IEE report. These lines are proposed along the road in mosly urban/ rural areas of 7 nos districts Indore, Khandwa, Burhanpur, Khargone, Barwani, Dhar & Jhabua. This final route alignment does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of final alingment route. Progress of additional feeders & distribution lines of Indore region is 55.17% as on December 2017.

87. **Additional Feedrers & Distribution Lines for Substation 33/11 KV of Ujjain Region-** This is integrated part of scope of project of original IEE report. Additional feeders will be 28 nos in Ujjain Region. Stringing of of distribution lines will be 89.9 km for 33 KV (S/s), 64 km for 11 KVA distribution lines (S/s) & 89.5 km 11 KVA distribution lines (Addl & Aug) in Ujjain Region. Here 348.8 km 32 KVA distribution lines will be additional works for feeder birfurcation, which was not part of original IEE report. These lines are proposed along the road in mosly urban/ rural areas of 6 nos districts Ujjain, Dewas, Shajapur, Ratlam, Mandsaur & Neemuch. This final route alignment does not cross & passing near to protected reserves forests / national park/ sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of final alingment route. Progress of additional feeders & distribution lines of Ujjain region is 64.28% as on December 2017.

88. **100 KVA Distribution Transformer & Associated 11 KV Line & LT line on AB cable of Indore Region-** This is new scope of project progress, which was not part of original IEE report.Updated scope of project, comprises installation of permanent 100 KVA DTR to replace temperory rental distribution transformer of 414 nos in Indore Region. Stringing of of total associated distribution lines will be 11 KV line (DTR) of 210 km & LT distribution line 171 KM in Indore Region. These total 381 KM lines will be 11 KV & LT lines using Rabbit conductor on 8 mt long PCC pole & LT using AB cable on 8 mtr long PCC poles along the road & farming areas of 7 nos districts Indore, Khandwa, Burhanpur, Khargone, Barwani, Dhar & Jhabua. Progress of 100 KVA DTR & associated distribution lines of Indore region is 86.83% as on December 2017.

89. Indore (O&M) circle will have 124 nos DTR with associated distribution networkof 11 KV lines of 62 km & LT lines 51 km. This final route alignment does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of final alingment route. Progress of 100 KVA DTR & associated distribution lines of Indore (O&M) circle is 89.45% as on December 2017.

90. Khandwa circle will have 78 nos DTR with associated distribution networkof 11 KV lines of 40 km & LT lines 32 km. This final route alignment does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of final alingment route. Progress of 100 KVA DTR & associated distribution lines of Khandwa circle is 72.28% as on December 2017.

91. Khargone circile will have 86 nos DTR with associated distribution networkof 11 KV lines of 44 km & LT lines 36 km. This final route alignment does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of final alingment route. Progress of 100 KVA DTR & associated distribution lines of Khargone circle is 78% as on December 2017.

92. Barwani circile will have 16 nos DTR with associated distribution networkof 11 KV lines of 8 km & LT lines 7 km. This final route alignment does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of final alingment route. Progress of 100 KVA DTR & associated distribution lines of Barwani circle is 92% as on December 2017.

93. Dhar circile will have 92 nos DTR with associated distribution networkof 11 KV lines of 47 km & LT lines 38 km. This final route alignment does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of final alingment route. Progress of 100 KVA DTR & associated distribution lines of Dhar circle is 75.87% as on December 2017.

94. Jhabua circile will have 18 nos DTR with associated distribution networkof 11 KV lines of 9 km & LT lines 7 km. This final route alignment does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of

final alingment route. Progress of 100 KVA DTR & associated distribution lines of Jhabua circle is 95.58% as on December 2017.

95. **100 KVA Distribution Transformer & Associated 11 KV Line & LT line on AB cable of Ujjain Region-** This is new scope of project progress, which was not part of original IEE report.Updated scope of project, comprises installation of permanent 100 KVA DTR to replace temperory rental distribution transformer of 807 nos in Ujjain Region. Stringing of of total associated distribution lines will be 11 KV line of 413 KM & LT distribution line 333 KM in Ujjain Region. These total 746 KM lines will be 11 KV & LT lines using Rabbit conductor on 8 mt long PCC pole & LT using AB cable on 8 mtr long PCC poles along the road & farming areas of 6 nos districts Ujjain, Dewas, Shajapur, Ratlam, Mandsaur & Neemuch. Progress of 100 KVA DTR & associated distribution lines of Ujjain region is 85.72% as on December 2017.

96. Ujjain circile will have 305 nos DTR with associated distribution networkof 11 KV lines of 156 km & LT lines 126 km. This final route alignment does not cross & passing near to protected reserves forests/national Park/sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river crossing on the way of final alingment route. Progress of 100 KVA DTR & associated distribution lines of Ujjain circle is 94.37% as on December 2017.

97. Dewas circile will have 170 nos DTR with associated distribution networkof 11 KV lines of 87 km & LT lines 70 km. This final route alignment does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of final alingment route. Progress of 100 KVA DTR & associated distribution lines of Dewas circle is 88.07% as on December 2017.

98. Shajapur circile will have 78 nos DTR with associated distribution networkof 11 KV lines of 40 km & LT lines 32 km. This final route alignment does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of final alingment route. Progress of 100 KVA DTR & associated distribution lines of Shajapur circle is 72.70% as on December 2017.

99. Ratlam circile will have 137 nos DTR with associated distribution networkof 11 KV lines of 70 km & LT lines 57 km. This final route alignment does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of

final alingment route. Progress of 100 KVA DTR & associated distribution lines of Ratlam circle is 90.34% as on December 2017.

100. Mandsaur circile will have 94 nos DTR with associated distribution networkof 11 KV lines of 48 km & LT lines 39 km. This final route alignment does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of final alingment route. Progress of 100 KVA DTR & associated distribution lines of Mandsaur circle is 73.48% as on December 2017.

101. Neemuch circile will have 23 nos DTR with associated distribution networkof 11 KV lines of 12 km & LT lines 9 km. This final route alignment does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is no rail line & river coossing on the way of final alingment route. Progress of 100 KVA DTR & associated distribution lines of Neemuch circle is 80.34% as on December 2017.

102. Most of substations have been constructed & in operational phase. Please refer photographs of substations of completed, under construction & propsed lands are provided in Appendix- VI. Physical progress of sub-stations has been summarized & shown in Table no-3.2

Table 3.2 Summary of Physical Progress of Sub-stations of DISCOM-West

S. No.	Name of Circle	Name of Sub Station (Original Scope)	Physcial Progress in % as on 31 December 2017		Updated Sub-station (Changed Site Location Detail)
1	Indore	South Div. Office	100%	Completed	Original
2		IG Office Indore	20%	Under Progress	Change Location Nipania
3		Chhota Bangarda	0%	Not Started	Original
4		Amar Tekri North Div	100%	Completed	Change Location Sector-E
5	Indore O&M	Avlai	100%	Completed	Original
6		Kisanganj	100%	Completed	Original
7		Khalkhala	100%	Completed	Original
8	Khandwa	Nawali	100%	Completed	Original
9		Bilankheda	100%	Completed	Original
10	Burhanpur	Talawadi	100%	Completed	Original
11		Collector office Town	100%	Completed	Original
12	Khargone	Mohammadpur	100%	Completed	Original
13		Hirapur	100%	Completed	Original
14		Chitawad	0%	Not Started	Change Location Nilkanth
15		Durgapur	90%	Under Progress	Change Location Bhangaon
16	Barwani	Rakhi Bujurg	100%	Completed	Original
17	Dhar	Kabarwa	100%	Completed	Original

18		Meghapura	50%	Under Progress	Change Location Narwali
19		Kawada	90%	Under Progress	Original
20		Phoolgawadi	100%	Completed	Original
21	Jhabua	Badi Khattaly	100%	Completed	Original
22		Pitol	50%	Under Progress	Change Location Mohankot
23	Ujjain	Ruee	100%	Completed	Original
24		Banjari	100%	Completed	Original
25		Pingleshwer	10%	Under Progress	Change Location Sandla
26		Palduna	100%	Completed	Original
27	Dewas	Thuria (Seti)	100%	Completed	Original
28		Gada Gaon Nimasa	100%	Completed	Original
29		Neori Phata	25%	Under Progress	Original
30	Shajapur	Siroliya	100%	Completed	Original
31		Tajpur ukala	100%	Completed	Original
32		Dharola	100%	Completed	Original
33	Ratlam	Piplodi	100%	Completed	Original
34		Mamatkheda	100%	Completed	Original
35	Mandsaur	Jamalpura	100%	Completed	Original
36		Kothdabahadur	100%	Completed	Original
37		Garoda	100%	Completed	Original
38	Neemuch	Khankhedi	100%	Completed	Original
39		Barkheda	0%	Not Started	Original
40		Jaliner	100%	Completed	Change Location Achalpura

103. Progerss of other additional scope of work for 33 KV distribution line for additional feeder , installation of 100 KVA DTR & associated 11 KV & LT distribution lines have been shown in table no.3.3

Table 3.3 Summary of Physical Progress of other additional scope of work

S. N.	Description of WorK	UOM	Total Survey of Indore Region & Ujjain Region	Executed as on 31 Dec 2017	% of Progress
1	33 KV distribution line (Feeder)	KM	632.8	511.54	80.84
2	100 KVA DTR	No.	1221	1156	94.68
3	11 KV distribution line (DTR)	Km	623	380.43	61.06
4	LT distribution line	Km	504	466.75	92.61

3.5. Implementation Schedule:

104. DISCOM-West project implementation activities were started in Q2 2014. Overall 80% project implementation has been completed in Q-3-2017 as per scheduled. There is no change in implementation schedule as updated in January 2018, due to change of site locations of substations & additional scope of 100 KV DTR & associated distribution lines.

105. Distribution system improvement has commenced in June 2014 and still expected to be completed in June 2018 including changed scope & additional scope of works. Figure 3.2 presents the Project implementation schedule.

Activities	2013		2014				2015				2016				2017				2018	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
MP DISCOM-WEST																				
Preparation of Bidding Documents																				
Bidding and Contract Signing																				
Implementation & Commissioning																				
Review																				
Project Completion Report																				

Figure 3.2 Project Implementation Schedule

3.6. Sub-station Land Area Effect of Changed Scope

106. There will be no physical or economic displacement of people. All the changed site location of proposed substations of the project will be built on government land. No household will lose their productive resources or livelihoods. Therefore, impacts associated with land acquisition are deemed to be minor.

107. Due to non-availability of land at proposed original sub-station locations, it has informed that 8 nos site location of new substations has been changed under PPR-41-I & II & updated in this report based on actual survey, aquistion of government land & implementation of subprojects going on.

108. The 40 nos subprojects that will involve 33/11 kV substation require about 7.03 hactare for construction purpose. Distribution lines will not required acquiring any land, as it will be striging along the road. Table 3.4 gives a summary of the land area affect by change substation site locations.

Table 3.4. Summary of Updated Land Area of 33/11 KVA Substation location

Details of Sub-Station PPR-41 Lot-I				
S. N.	**Name of Circle**	**Name of Sub Station**	**Change of Location**	**Area in Heactare**
1	Indore City circle	South Div. Office		0.0276
2		IG Office Indore	**Nipaniya**	0.1
3		Amar Tekri North Div.	**(Sector-E)**	0.12
4		Chhota Bangarda		0.1
5	Indore O&M	Avlai		0.22
6		Kisanganj		0.39375
7		Khalkhala		0.1463
8	Khandwa	Nawali		0.165
9		Bilankheda		0.165
10	Burhanpur	Talawadi		0.2
11		Collector office Town		0.096
12	Khargone	Mohammadpur		0.165
13		Hirapur		0.14
14		Chitawad	**Nilkanth**	0.16
15		Durgapur/ (Bhangaon)	**Bhangaon**	0.256
16	Barwani	Rakhi Bujurg		0.1485
17	Dhar	Kabarwa		0.165
18		Meghapura	**Narwali**	0.165
19		Kawada		0.165
20		Phoolgawadi		0.165
21	Jhabua	Badikhattali		0.1224
22		Pitolnaka	**Mohan kot**	0.1616
Total				3.55

Details of Sub-Station PPR-41 Lot-II				
S. No.	**Name of Circle**	**Name of Sub Station**	**Change of Location**	**Area in Heactare**
1	Ujjain	Ruee		0.19
2		Banjari		0.1625
3		Pingleshwer	Sandla	0.22
4		Palduna		0.3025
5	Dewas	Thuria (Seti)		0.165
6		Gada Gaon Nimasa		0.175
7		Neori Phata		0.12
8	Shajapur	Siroliya		0.1645
9		Tajpur Ukala		0.3325
10		Dharola		0.1625
11	Ratlam	Piplodi		0.1536
12		Mamatkheda		0.1625
13	Mandsaur	Jamalpura		0.1625
14		Kothdabahadur		0.1625
15		Garoda		0.1625
16	Neemuch	Khankhedi		0.1625
17		Barkheda		0.36
18		Jaliner	Achalpura	0.1625
Total				**3.4831**

109. There will be no need of acquired land for additional scope of 100 KVA DTR & associated distribution 11 KV line under PPR-Lot-42-I&II.

110. The outputs for the updated scope of project activities for distribution system improvement component; the objective is to create more substations to feed the distribution network while improving the overall quality & reliability of power supply.

CHAPTER

4. DESCRIPTION OF ENVIRONMENT

4.1. Physical Resources

4.1.1. Topography, Geology and Soils

111. The project and subprojects of DISCOM-West are located in various geographic locations in Indore & Ujjain region of western MP known as Malawa & Nimar, which lies between latitude 21º6' and 25º15'N and longitude 74º47" and 77º47'E. DISCOM-West covers 77021 Square KM out of total MP covers a geographical area of 308,245 square km (km2) or about 24.98 % of the total area of MP is land-locked and surrounded by Maharashtra, Gujarat and Rajasthan. Western MP is traversed by the Malwa Plateao hill ranges running western areas. The plateau that forms a large part of the region carries the name Malwa Plateau, after the region. The average elevation of the Malwa plateau sits at 500 metres, and the landscape generally slopes towards the north.

112. Most of western MP has an elevation of between 300 to 550 meters above mean sea level. Low-lying areas are in the narrow Narmada valley in the central southern parts. In general, MP stretches across a geographically elevated position.[18] The area is part of peninsular plateau consisting of sedimentary and metamorphic rocks and is structurally part of the peninsular block. The region has been one of the important producers of opium in the world. Cotton and soybeans constitute other important cash crops. The soil of the region is rich and fertile and of variety ranging from rich clayey to gravelly. In that region black, brown and bhatori (stony) soil make up the main classes of soil.[19] The region, predominantly agricultural, enjoys the black, volcanic soil ideal for the cultivation of cotton; textile manufacture represents an important industry.

4.1.2. Meteorology and Climate

113. **Climate:** Western MP has a typically tropical climate varying from dry sub-humid to semi-arid, with three distinct seasons - winter, summer and monsoons. Malwa's elevation gives it a mild, pleasant climate; a cool morning wind, the karaman, and an evening breeze, the Shab-e-Malwa, make the summers less harsh.

114. **Rainfall:** Annual rainfall in the western part of state varies from 600 mm to 1,000 mm while the average rainfall in MP is 1,200 mm. There is one distinct rainy

[18] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).
[19] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).

season when MP receives rains through the southwest monsoon in the months of June to October. Production in almost 70% of the agriculture area remains highly dependent on rainfall.

115. **Temperature:** Western MP has a tropical climate. The lowest temperature during the cooler months of December and January is 13°C and in the summer months of May and June, the temperature reaches 45°C.[20] Most parts of western MP in summer are hot and humid.

4.1.3. Air Quality and Noise

116. Air quality in MP is considered to be good except in few urban and industrial centers where air quality is poor due to industrial activities and transport sources. Ambient air quality measurements are conducted on a continuous basis by the Madhya Pradesh State Pollution Control Board (MPPCB) in various cities in MP.[21] Ambient air quality measurements generally comply with Air Prevention and Control of Pollution Act 1981 (**Appendix-III**) and the National Ambient Air Quality Standards.[22] & noise standards as given by the MoEFCC:[23] are provided furthermore in Annexure-XI.

117. As of February 2013, MPPCB has come up with new guidelines for curbing air and noise pollution associated with construction activities, with the implementation of the Indore Municipal Corporation. Under the new guidelines, all construction works will have to be carried out between 7 am and 7 pm, and construction sites should be covered with acoustic screens and enclosures to control noise. Aside from this, contractors will have to enclose noisy machineries in acoustic enclosures. Some substations of DISCOM-West project area have been monitored base line ambient air & noise level monitoring during September 2017. All results of ambient air & noise level of monitoring found very well within limits of prescribed standards.which has shown in Table no-4.1 of ambient air quality & 4.2 of noise level monitoring of project areas.

[20] India – WRIS (Water Resources Information System of India). http://india-wris.nrsc.gov.in/wrpinfo/index.php?title=Madhya_Pradesh#Climate. (Accessed 3 August 2013)
[21] Madhya Pradesh State Pollution Control Board. Ambient air quality measurements (interactive). http://www.mppcb.nic.in/aaqm_data.htm. (Accessed 27 July 2013)
[22] The Central Pollution Control Board. http://cpcb.nic.in/National_Ambient_Air_Quality_Standards.php. (Accessed 3 August 2013)
[23] Ministry of Environment and Forests (MoEFCC). http://MoEFCC.gov.in/citizen/specinfo/noise.html. (Accessed 2 August 2013)

Table .4.1. Ambient Air Quality Monitoring of Project Area

Ambient Air Monitoring Results								
Sr.No	Parameters	Permissible Limits	Ambient Air Monitoring Results					
			Locations					
			Near Best Price, Nipaniya	Sanwer Road Industrial Area Sector-E	Awlay, Near Mhow	Kishan Ganj, Near Mhow	Sandla, Ujjain	Devgarh, Ujjain
1	Particulate Matter (PM_{10})	100 µg/m³	74.9	78.8	51.8	62.5	54.8	50.4
2	Particulate Matter ($PM_{2.5}$)	60 µg/m³	39.4	34.5	23.5	29.4	28	22.8
3	Sulphur Dioxide (SO_2)	80 µg/m³	19.3	17.1	10.5	14.1	11.6	9.3
4	Oxides of Nitrogen (NO_x)	80 µg/m³	25.5	21.3	14.3	18.5	17	13.6
5	Carbon Mono-Oxide(CO)	2000 µg/m3	260	215	73	81	69	74
Sampling Date: 27.09.2017 & 30.09.2017								
Sampling Duration: 24 Hours								
Reference Method & Standard: As per National Ambient Air Quality Standard (NAAQS)								

Table .4.2. Noise Level Monitoring of Project Area

Sr.No	Unit	Permissible Limit (Day Time)	Noise Monitoring Results					
			Locations					
			Near Best Price, Nipaniya	Sanwer Road Industrial Area Sector-E	Awlay, Near Mhow	Kishan Ganj, Near Mhow	Sandla, Ujjain	Devgarh, Ujjain
1	dB(A)	75	73.8	69.4	55.3	57.8	55.2	53

Noise Monitoring Results								
Sr.No	Unit	Permissible Limit (Night Time)	Results					
			Locations					
			Near Best Price, Nipaniya	Sanwer Road Industrial Area Sector-E	Awlay, Near Mhow	Kishan Ganj, Near Mhow	Sandla, Ujjain	Devgarh, Ujjain
1	dB(A)	70	69.4	64	44.9	46.4	42.1	46.5
Sampling Date: 27.09.2017 & 30.09.2017								
Reference Standard: As per Central Pollution Control Board (CPCB)								

4.1.4. Natural Hazards

118. **Seismicity:** The Bureau of Indian Statistics (IS-1893 Part 1, 2002) classified India into four seismic Regions based on various scientific inputs including earthquake data from India Meteorological Department (IMD). The seismic Regions in India are given below:

Seismic Region	Intensity on Modified Mercalli Scale	% of total area
II (Low intensity Region)	VI (or less)	43%
III (Moderate intensity Region)	VII	27%
IV (Severe intensity Region)	VIII	18%
V (Very severe intensity Region)	IX (and above)	12%

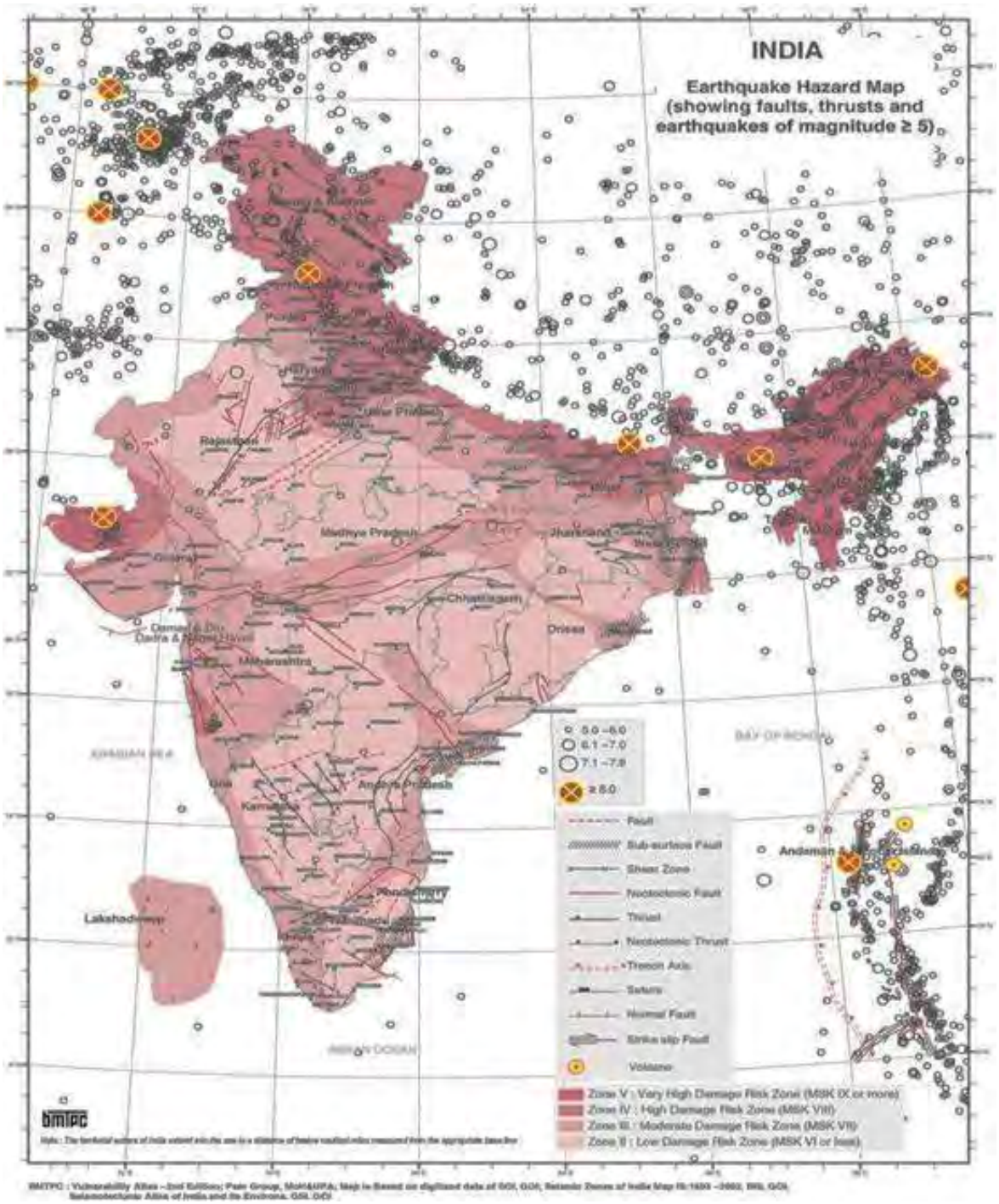


Figure 4.1 Seismic Regions of India

119. According to IMD, MP falls with Regions II and III (i.e., low to moderate damage risk seismic Region). Historically, parts of MP have experienced seismic activity in the range of intensity 5 to 6 of the Modified Mercalli Intensity (MMI) scale. Based on historical records of earthquake events in India from 16 June 1819 to 18 September 2011, only one earthquake occurred in Madhya Pradesh on 22 May 1997 at intensity 6 based on MMI scale. IMD has an earthquake monitoring and a real time seismic monitoring for early warning of tsunamis. All proposed & existing substations of DISCOM-West project falls under Region-III, having moderate seismic risk.

120. **Drought and Floods:** With its vast expanse, geographical features and varying climate conditions, different parts of MP have been perennially prone to drought conditions as well as floods. During 2007-2008, 39 out of 50 districts (165 *Tehsils* and one cluster) of MP have been declared as drought affected. Additionally, district in the western and northwestern parts of MP are considered to be susceptible to desertification. These regions also do not have a thick forest cover in comparison with the central and eastern parts of MP. The calamity events recorded from 1991-2007 are shown in Table 4.3

Table 4.3 Calamity Events in Madhya Pradesh (1991-2007)

Year	No. of Districts	Name of Districts	Type of Calamity
1991-92	23	Rewa, Sidhi, Satna, Shahdol, Jabalpur, Balaghat, Chhindwara, Mandla, Seoni, Rajgarh, Betul, Dhar, Jhabua, Khandwa, Sagar, Damoh, Panna, Tikamgarh, Chhatarpur, Gwalior, Guna, Data, Ratlam	Drought
1992-93	4	Mandla, Khandwa, Chhindwara, Balaghat	Drought
1994-95	4	Rajgarh, Tikamgarh, Balaghat, Khandwa	Drought
1995-96	8	Panna, Tikamgarh, Chhatarpur, Rajgarh, Ratlam, Khandwa, Jhabua, Chhindwara	Drought
1996-97	5	Balaghat, Jabalpur, Seoni	Drought
1997-98	35	Indore, Khargone, Khandwa, Ujjain, Dewas, Shajapur, Mandsaur, Ratlam, Gwalior, Shivpuri, Guna, Bhind, Rewa, Shahdol, Satna, Sagar, Damoh, Panna, Chhatarpur, Tikamarh, Bhopal, Betul, Raisen, Rajgarh, Sehore, Vidisha, Hoshangabad, Jabalpur, Balaghat, Chhindwara, Seoni, Mandla, Narsinghpur	Excessive Rains &Hail Storms
1998-99	23	Vidisha, Dhar, Neemuch, Ujjain, Bhopal, Ratlam, Betul, Shajapur, Sagar, Guna, Chhindwara, Damoh, Dindori, Dewas, Khandwa, Khargone, Indore, Mandsaur, Gwalior, Sehore, Mandla, Jabalpur, Rajgarh	Hail Storms
1999-2000	4	Dhar, Jhabua, Khargone, Badwani	Drought
	6	Hoshangabad, Harda, Raisen, Sehore, Narsinghpur, Dewas	Flood
2000-01	32	Ratlam, Rajgarh, Panna, Seoni, Jhabua, Ujjain, Khargone, Badwani, Balaghat, Khandwa, Dhar, Neemuch, Katni, Bhind, Mandsaur, Chhindwara, Mandla, Jabalpur, Damoh, Chhatarpur, Narsinghpur, Tikamgarh, Shahdol, Indore, Sheopur, Satna, Betul, Sidhi, Dindori	Drought
2001-02	6	Ujjain, Shajapur, Ratlam, Rajgarh, Seoni & Chhindwara	Drought
2002-03	33	Ratlam, Rajgarh, Panna, Seoni, Ujjain, Morena, Gwalior, Balaghat, Neemuch, Katni, Shivpuri, Guna, Datia, Bhind, Mandsaur, Chhindwara, Mandla, Jabalpur, Damoh, Chhatarpur, Tikamgarh, Shahdol, Shajapur, Barwani, Sheopur, Satna, Sidhi, Dindori, Raisen, Sagar, Rewa, Umaria and Vidisha	Drought
2004-05	21	Sheopur, Datia, Tikamgarh, Balaghat, Panna, Chhatarpur, Rewa, Shahdol, Sidhi, Chhindwara, Harda, Hoshangabad, Seoni, Betul, Dewas, Khargone, Barwani, Ratlam, Umaria, Sehore, Ujjain	Drought
2005-06	9	Tikamgarh, Ratlam, Mandsaur, Shajapur, Chhatarpur, Khargone, Rajgarh, Chhindwara, Panna	Drought
	3	Chhindwara (Chindwara)	Drought
		Shajapur (Agar), Panna (Gunnor & Pawai)	Drought
2006-07	9	Panna, Tikamgarh, Chhatarpur, Satna, Gwalior, Shivpuri, Rewa, Katni, Ratlam	Drought

4.1.5. Water Resources

121. **Surface Water:** The western part of the MP region is drained by the Mahi River, while the Chambal River drains the central part, and the Betwa River and the headwaters of the Dhasan and Ken rivers drain the east. The Shipra River is of historical importance

because of the Simhasth mela, held every 12 years. Other notable rivers are Parbati, Gambhir and Choti Kali Sindh. Annual run-off from rivers within MP is estimated at 81,719 hectometer (hm), out of which about 49, 743 hm can be harnessed for irrigation purpose.[24] Reprrsentative sample of DISCOM-West project area have been monitored base line water quality monitoring during September 2017. All results of surface water quality found suitable for human consumption.which has shown in Table no- 4.4 of suface water quality monitoring of project area.

Table .4.4. Surface Water Quality Monitoring of Project Area

Sr.No.	Name of Parameter	Unit	Method Reference	As per IS 10500:2012		Chambal River	Narmada River	Kshipra River
				Desirable	Permissible			
1	pH at 25°C	---	IS: 3025 (Part 11)- 1983	6.5-8.5	NR	7.91	7.74	7.88
2	Total Dissolved Solids	mg/L	IS: 3025 (Part 16)-1984	500	2000	445.0	182.0	394.0
3	Turbidity	NTU	IS: 3025 (Part 10)-1984	-	-	1.2	0.19	1
4	Total Hardness as CaCO3	mg/L	IS: 3025 (Part 21)-2009	200	600	110.0	118.0	184.0
5	Total Alkalinity as CaCO3	mg/L	IS: 3025 (Part 23)-1986	200	600	175.0	132.0	220.0
6	Chloride as Cl	mg/L	IS: 3025 (Part 32)-1988	250	1000	27.5	22.0	33.0
7	Nitrate as NO3	mg/L	APHA 22nd edition	45	NR	6.00	5.20	4.80
8	Calcium as Ca	mg/L	IS: 3025 (Part 40)-1991	75	200	22.5	25.0	37.0
9	Magnesium as Mg	mg/L	IS: 3025 (Part 46)-1994	30	100	6.25	7.50	9.50
10	Iron as Fe	mg/L	IS: 3025 (Part 53)-2003	0.3	NR	<0.1	<0.1	<0.1
11	Sulphate as SO4	mg/L	IS: 3025 (Part 24)-1986	200	400	38.20	31.40	34.00
12	Total Coliform	MPN/100 ml	IS : 1622 - 1981	Absent	Absent	4	2	3
13	Odour	--	--	UO	UO	AG	AG	AG
14	E.Coli	MPN/100 ml	IS : 1622 - 1981	Absent	Absent	Absent	Absent	Absent
15	Color	Hazen	IS: 3025 (Part 4)-1983	5	25	<1.0	<1.0	<1.0
16	Dissolved Oxygen (DO)	mg/L	IS:3025 (Part 38) -1989	-	-	6.9	7.4	6.7
17	Copper as Cu	mg/L	IS: 3025 (Part 42)-1992	0.05	1.5	<0.01	<0.01	<0.01
18	Specific Conductivity at 25°	mg/L	IS: 3025 (Part 14)-1984	-	-	650	290	608
19	Chemical Oxygen Demand	mg/L	IS: 3025 (Part 58)-2006	-	0.0	6.5	8.2	7.4
20	BOD for 3days at 27°C	mg/L	IS: 3025 (Part 44)-1993	-	-	<3.0	<3.0	<3.0
21	Oil & Grease	mg/L	IS:3025 (Part 39) - 2012	1	5	<1.0	<1.0	<1.0
22	Potassium as K	mg/L	APHA 22nd Edition	-	-	3.5	4.8	4

Date of Analysis Started	27.09.2017
Date of Analysis Completed	30.09.2017
Reference Standard	As per IS 10500:2012

122. **Groundwater:** Groundwater use is common in MP with groundwater development at 48 %.[25] Due to varied topographical, rainfall and climatic conditions in MP, the availability of water is not uniform spatially or temporally. There is an increasing demand of water for human consumption, agriculture and industrial purposes, etc. In May 2001, a total of 790 water samples were collected from the National Hydrograph Network Stations in MP and analyzed by the Chemical Lab of NCR in Bhopal. Also some ground water sample collected in project area, all results of water quality found suitable for human consumption. However TDS, Hardness, Alkalinity, Chlorides are high in ground water the project areas, which has shown in Table no-4.5 of Ground water quality monitoring.

[24] Ibid 19.
[25] http://www.cgwb.gov.in/gw_profiles/st_mp.html. (Accessed 2 August 2013)

Table .4.5. Ground Water Quality Monitoring of Project Area

Sr.No.	Name of Parameter	Unit	Method Reference	As per IS		Borewell Water - Sandala	Borewell Water - Barwani
				Desirable	Permissible		
1	pH at 25°C	...	IS: 3025 (Part 11)- 1983	6.5-8.5	NR	7.50	7.38
2	Total Dissolved Solids	mg/L	IS: 3025 (Part 16)-1984	500	2000	1240.0	1032.0
3	Turbidity	NTU	IS: 3025 (Part 10)-1984	-	-	<0.1	<0.1
4	Total Hardness as CaCO3	mg/L	IS: 3025 (Part 21)-2009	200	600	520.0	465.0
5	Total Alkalinity as CaCO3	mg/L	IS: 3025 (Part 23)-1986	200	600	360.0	315.0
6	Chloride as Cl	mg/L	IS: 3025 (Part 32)-1988	250	1000	549.0	375.0
7	Nitrate as NO3	mg/L	APHA 22nd edition	45	NR	4.90	7.00
8	Calcium as Ca	mg/L	IS: 3025 (Part 40)-1991	75	200	190.0	180.0
9	Magnesium as Mg	mg/L	IS: 3025 (Part 46)-1994	30	100	44.50	36.00
10	Iron as Fe	mg/L	IS: 3025 (Part 53)-2003	0.3	NR	<0.1	<0.1
11	Sulphate as SO4	mg/L	IS: 3025 (Part 24)-1986	200	400	80.00	52.00
12	Total Coliform	MPN/100 ml	IS : 1622 - 1981	Absent	Absent	Absent	Absent
13	Odour	..	..	UO	UO	AG	AG
14	E.Coli	MPN/100 ml	IS : 1622 - 1981	Absent	Absent	Absent	Absent
15	Color	Hazen	IS: 3025 (Part 4)-1983	5	25	<1.0	<1.0
16	Dissolved Oxygen (DO)	mg/L	IS:3025 (Part 38) -1989	-	-	6.2	5.3
17	Copper as Cu	mg/L	IS: 3025 (Part 42)-1992	0.05	1.5	<0.01	<0.01
18	Specific Conductivity at 2	mg/L	IS: 3025 (Part 14)-1984	-	-	1970	1645
19	Chemical Oxygen Deman	mg/L	IS: 3025 (Part 58)-2006	-	0.0	18.5	21.5
20	BOD for 3days at 27°C	mg/L	IS: 3025 (Part 44)-1993	-	-	<3.0	3.5
21	Oil & Grease	mg/L	IS:3025 (Part 39) - 2012	1	5	<1.0	<1.0
22	Potassium as K	mg/L	APHA 22nd Edition	-	-	31.5	9.5

Date of Analysis Started	**27.09.2017**
Date of Analysis Completed	**30.09.2017**
Reference Standard	**As per IS 10500:2012**

123. Based on the results, groundwater quality in the northern region of MP is generally good but shows high salinity in localized areas in the districts of Shajapur, Ratlam, Ujjain etc. Very high values (more than 3,000 m/cm) of electrical conductivity (EC) were found in few localized pockets in these areas while those ranging from 750 to 1,500 m/cm at 25°C were found in the western parts of MP. Results of analysis showed that generally, ground water in MP is alkaline-earth bicarbonate type. Figure 4.2 shows the groundwater quality map of MP.[26]

[26] Central Ground Water Board, Geochemical Studies. http://cgwb.gov.in/ncr/GWQuality.htm. (Accessed 13 August 2013)

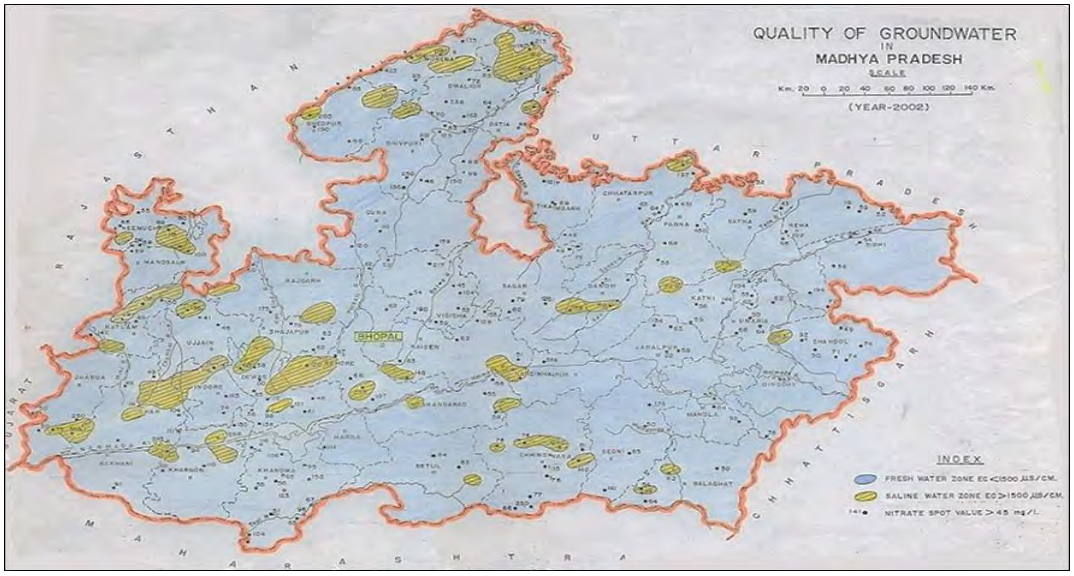


Figure 4.2 Groundwater Quality of MP

124. **Drainage:** The drainage system of the state is governed by six major river basins namely the Ganga basin (consisting of Yamuna, Tons and Sone sub-basins), Narmada basin, Godavari basin, Tapti basin, Mahi basin and Mahanadi[27] basin. Details of basins and sub-basins with respective drainage area in MP (including western part of MP) and corresponding water availability are provided in Table 4.6. None of the subprojects of DISCOM-West lie near important drainage bodies and are not likely to cause significant impacts on drainage patterns

Table 4.6. Basin Wise Water Resources and Availability[28]

Name of Basin	Drainage Area (Sq.km)	Water Availability (hm)	Water Share of MP (hm)
1. Ganga Basin			
a. Yamuna sub-basin	1,42,250	27,267	23,642
b. Sone sub basin	28,880	7870*	3970*
c. Tons sub-basin	11,924	2,244	2244
2. Narmada Basin	85,149	34,542	22,511
3. Godavari/Waingaga sub Basin	23,388	5083*	2700*
4. Tapi Basin	9,800	2,401	1,646
5. Mahi Basin	6,700	1,952	338
6. Mahanadi	154	Not Defined	Negligible
Total	3,08,245	81,719	57,051

* On account of division of MP into MP and Chhattisgarh, 2001-2002, the water availability may have changed.

[27] The major portion of Mahanadi basin now lies in Chhattisgarh.
[28] Ibid 19.

4.2. Biological Resources

4.2.1. Terrestrial Ecology

125. **Flora;** MP is very rich in terms of forest wealth compared to its neighbors Maharashtra, Gujarat and Rajasthan. MP is ranked fourth in the country in terms of forest wealth. According to India State of Forest Report (2011) published by the Forest Survey of India,[29] MP has a recorded forest area at 94,689 km^2, which is about 30% of its total geographic area. Out of this area, reserved forests constitute 65.36%, protected forests 32.84%, and un-classed forests 1.8%. Figure 4.3 shows the map of forest cover in MP. None of the subprojects of DISCOM-West lie near any forests or wildlife sanctuaries and are not likely to cause significant impacts on any forests or wildlife sanctuaries or other important natural habitats

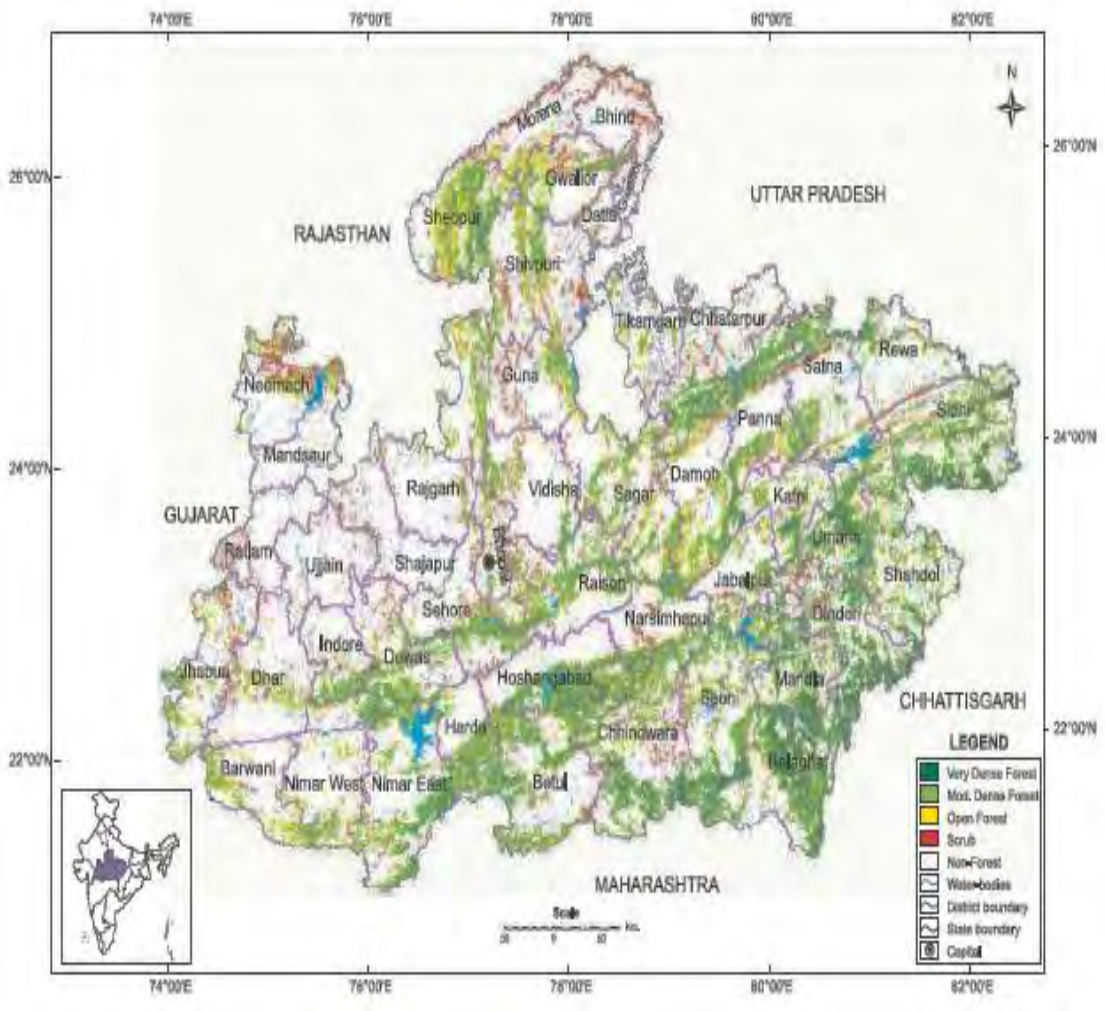


Figure 4.3 Map of Forest Cover in Madhya Pradesh

[29] The Forest Survey of India, Ministry of Environment and Forests. http://www.fsi.org.in/sfr_2011.htm. (Accessed 3 August 2013)

129. The GoI and the World Wildlife Fund (WWF) launched the "Project Tiger" in 1973 under which the Kanha National Park was one of the first nine protected areas selected. None of National Park falls in western MP region & however 5 sancuaries located in western MP, none of the subprojects of DISCOM-West lie near any protected areas, and are not likely to cause significant impacts on any forests or wildlife sanctuaries or other mportant natural habitats.[32]

4.2.2. Aquatic Ecology

130. The aquatic ecology in MP in general terms, is in fair condition with extensive vegetation cover including riparian vegetation and seems to present a significant regulatory factor for high water quality and aquatic ecosystem integrity. Freshwater fish and decapods crustacean (crabs, freshwater shrimp or prawns) faunas are highly diverse in surface water.[33] There are no species listed under the IUCN Red List. However, listed among the identified impacts on aquatic biodiversity are deforestation, agriculture (including pesticides and irrigation), urban and industrial development, and river regulation for water and hydropower production, mining, introduction of exotic species, dumping of solid wastes, and dredging and channelization. None of the subprojects of DISCOM-West lie near any important aquatic resources and are not likely to cause significant impacts on any aquatic resources.

4.3. Socioeconomic Profile

131. **Demography:** MP is the second largest State in the country in terms of area, with a population of 72.6 million. Out of the total population, 26% reside in urban areas and 74% in rural areas. MP is characterized by a variety of geographical, social and cultural variations. MP is home to the highest number of tribal population in India, spread out in remote and sparsely populated areas. Western MP covers population approx. 21.2 millions with highest polutation density 231 per square meter in MP state.

132. **Economy:** MP continues to be predominately agrarian with agricultural sector contributing about 26% to its gross state domestic product (GSDP) in 2007-2008.[34] The secondary sector comprising of mining, manufacturing, electricity, water supply and construction contributes about 26.93% to GSDP and the tertiary sector constituting railways and other transport, communication, banking and allied services, public services, tourism development across MP contributes 46.1%. It is the secondary and

[32] Ibid 32.
[33] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).
[34] Draft Madhya Pradesh State Action Plan on Climate Change. April 2012. Government of Madhya Pradesh zhttp://www.MoEFCC.nic.in/downloads/public-information/MP-SAPCC.pdf. (Accessed 3 August 2013)

tertiary sectors which have seen substantial growth in MP while growth in the primary sector being almost static. Western MP region contribute highest econmy in MP state with miximum industrilation & agriculture in this region.

133. Major industries are pharma, automobile cotton textiles, newsprint, pottery, cement, carpets, silk, rayon, jute, glass, steel, electrical engineering goods, electronics, telecommunications, petrochemicals, food processing, and automobiles. Western MP has also taken the lead in pharma Regions and is famous for its industrial hub in Pithampur.

134. **Water Supply and Sanitation:** MP ranks among the top states in accessibility and availability of safe drinking water supply. Nearly 90% of the total population has access to safe drinking water. Groundwater is primarily used for agricultural purposes in the project influence area. According to 2001 Census, majority of the people access drinking water near their premises (51%), around 25% have access within their premises, and 24% of households fetch their drinking water away from home. In terms of sanitation, MP is one of the five States (including Chhattisgarh, Jharkhand and Orissa) – largely rural that has less than 30% access to any sanitation source.

135. **Public Health:** Healthcare services network of MP comprises 50 district hospitals (13,400 beds), 333 community health centers, 1,155 primary health centers and 8,659 sub-centers. MP is one of the top two States that have high infant mortality rates with Panna standing at 93. MP is next only to Uttar Pradesh in high neonatal mortality rates (NNMR) standing at 44. NNMR is significantly high in rural areas than urban.[35] Despite improvements in the coverage of antenatal care, only 4 in 10 women in MP receive them.

136. **Land Use:** MP has 10 divisions and 50 districts. Nearly 44.33% of the land is utilized for agriculture with a few variations every year that largely depends upon the onset of monsoon and rainfall variability. MP has a total of 30.76 million hectares of land of which about 150.78 lakh hectares is the net sown area under agriculture. This represents 49% of the total geographical area. Forestland covers around 30% of the total geographical area with total cultivable area estimated at about 18.704 million ha.

[35] The Ministry of Home Affairs. Government of India. Annual Health Survey 2010–2011. http://www.censusindia.gov.in/vital_statistics/AHSBulletins/AHS_Baseline_Factsheets/M_P.pdf. (Accessed 3 August 2013)

Table 4.8. Land Use Pattern in Madhya Pradesh

Land Use	Area in '000 ha	Percentage
Total geographical area	30,825	
Reporting area for land utilization	30,757	100.00
Forests	8,696	28.27
Not available for land cultivation	3,401	11.06
Permanent pastures and other grazing lands	1,337	4.35
Land under misc. tree crops and groves	19	0.06
Culturable wasteland	1,160	3.77
Fallow lands other than current fallows	621	2.02
Current fallows	582	1.89
Net area sown	14,941	48.58

Source: Land Use Statistics, Ministry of Agriculture, GOI, 2008-09.

137. **Employment and Income:** MP is largely agrarian state with 43% of the workers being cultivators and 29% agricultural laborers. Industrial growth centres have been established in MP which aims to attract industries towards economic development. As of January 2011, MP had 733 large and medium industrial units providing direct employment to about 1.75 lakh people. In terms of economic groups, the landless laborers, the marginal and small farmers, the forest produce collectors, the construction workers and the household based artisans are the ones who are engaged in the most economically insecure livelihoods.

138. **Governance:** MP has a three-tier *Panchayat Raj* system and Urban Local Bodies as the institutions of local self-governance. Western MP has 2 Commissioner Divisions & 14 Districts with down the administrative levels of *Tehsils,* Community Development Blocks & Tribal Development Blocks.

- **Cultural and Archaeological Resources:** The following are the major cultural and archaeological resources (excavation sites) in MP that are ascertained as protected areas by the Archaeological Survey of India, and hence of national importance.[36] Architecturally significant of western MP include Dhar, Indore, Burhanpur, Mheshwar, Mandleshwar, Mandu, Omkareshwar and Ujjain.

[36] The Archaeological Survey of India, Government of India. http://asi.nic.in/asi_exca_imp_madhyapradesh.asp. (Accessed 4 August 2013)

- Uijain is situated on the eastern bank of the Sipra and well-known as the capital of Avanti, one of the 16 mahajanapadas in die 6th century B.C. and as the seat of a viceroy (*kumara*) of the Mauryan empire during the rule of Asoka in the 3rd century B.C., as mentioned in his Dhauli separate Rock-edict I. It is hallowed traditionally by its association with the jyotir-Linga of Mahakala and as one of seven holy cities of India, and remembered through later history and literature, especially the Meghaduta of Kalidasa.

139. None of the subprojects of DISCOM-West lie near any important cultural and archaeological resources and are not likely to cause significant impacts on cultural and archaeological resources.

140. **Climate change impacts:** MP is highly dependent of agriculture for livelihood and thus, vulnerable to climate change. According to the MP State Action Plan on Climate Change (draft report, April 2012),[37] some of the projected climate risks for MP are increase in maximum and minimum temperatures, changes in spatial and temporal distribution of monsoon, increase in frequency and intensity of rains, loss of rainy days, extended summers etc. Climate change will not only affect the natural resources but would also impact upon human health and availability of safe habitats in the future. These climate change risks may affect the envisioned sustainable development of MP.

[37] Ibid 36.

CHAPTER

5. ANALYSIS OF ALTERNATIVES

141. During the planning stage and preliminary design, alternatives were considered in the selection of the substation sites and distribution line routes to ensure that they are economically and financially feasible, at the same time, potential environmental impacts are minimized. Similar to MP DISCOM-West IEE updation, the following selection criteria guided the:

- Availability of a suitable right of way (ROW) and access to site by overhead distribution circuits;
- Location of existing distribution lines for potential interconnection;
- Distance to all weather roads, accessibility of heavy equipment under all weather conditions and access roads to the site;
- Site maintenance requirements, water supply and storage;
- Soil resistivity, drainage, and soil conditions;
- Cost of earth removal, earth conditions and earth moving;
- Atmospheric conditions and potential contamination from industry;
- Available space for future expansion and current requirements;
- Land ownership, avoidance of private land acquisition;
- Topographical features of the site, avoidance of flood plains, wetlands, forests and other environment-sensitive areas;
- Consideration of public safety and concern, avoidance of schools, playgrounds, hospitals, and structures of worship;
- Avoidance of waterways and existing utilities, railway, road crossings, etc.; and,
- Total costs including Distribution and distribution lines with due consideration of environmental factors.

142. A questionnaire/checklist with 17 questions following the criteria above is used during site planning updation. Preliminary site assessments conducted by the combined DISCOMs are based on the interpretation of available relevant maps of the area (i.e., topographic maps, vegetation maps, land use, etc.) aided by existing satellite images, aerial photos, location of permanent wetlands, and other environmentally-sensitive areas, and walk-over survey. A Following the criteria above, a questionnaire/checklist with 25 critera questions is used during site planning. Some considerations include the following:

- Whether any Nallah, water tank, canal, etc. is within the proximity of the proposed land should be clearly mentioned. In case of the existence of the above, the extent of water spread during maximum flood level should be indicated."
- "In the execution planning map, give the orientation of the Distribution lines (existing or proposed) and the distance of lines from the proposed site."

143. Preliminary site assessments conducted by DISCOM-West are based on the interpretation of available relevant maps of the area (i.e., topographic maps, vegetation maps, land use, etc.) aided by existing satellite images, aerial photos, location of permanent wetlands, and other environmentally-sensitive areas, and walk-over survey. During field works or walkover surveys, locations of forests, railways, schools, waterways, utilities, road crossings, structures of worship, etc. are identified along the alignments under consideration (or a "bee-line"). Soil characterization and land use evaluation are also carried out during the walk-over survey or inventorization.

144. From the outputs of preliminary evaluation, 8 nos proposed substation sites were changed due to non-avilibility of land like Chitwad, Pingleshwar, Pitolnaka, Jaliner etc , these substation were proposed in original scope of IEE for new 40 nos substations ,which are replaced 8 nos substations with suitable locations with extra 33 KVA distribution lines for feeder birfucations as shown Table no-3.2 . Susbstations & permanent 100 KVA DTR with associated 11 KVA & LT distribution lines to replace temperory rental distribution transformer are entirely located on government wastleland and are not likely to cause any significant environmental impacts. Table 5.1 presents a comparison of the general situation in case of "with project" and "without project" scenario.

Table 5.1. "With Project" and "Without Project" Scenario

No.	Parameter	With Project Scenario	Without Project Scenario
1	Electricity	Major effect, improved voltage, less fluctuation, increased availability	No effect
	Environment		
2	Effect on protected, sensitive, or forest areas	No effect, avoids protected, sensitive or forest areas	No effect
3	Effect on endanger species	No effect, avoids protected, sensitive or forest areas	No effect
4	Tree cutting	Minor effect, shall comply with the environmental safeguards provision of the ADB, GoI national	No effect

No.	Parameter	With Project Scenario	Without Project Scenario
		laws and regulations	
5	Air emissions	Major effect; improvement because of reduced usage of diesel generators currently employed for water abstraction from surface / ground water sources for employing on agricultural lands	No effect
9	Water supply	Improved water accessibility for agriculture purposes	No effect
	Social		
10	Disturbances of people / communities	During construction phase, temporary impact	No issue
11	Effect of business	Construction activities may employ local populace generating economic and livelihood generation opportunities. .	No issue
12	Status of living	Improve; access to electricity will reduce domestic load for women such as for cooking purposes, etc.	No change
	Economic		
13	Economic development	Greater rate of economic development expected	Slow development

CHAPTER

6. ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

6.1. Introduction:

145. The Ministry of Environment and Forests (MoEFCC) of GoI, in its notification in September 2006, has exempted Distribution projects from environmental clearances due to the non-polluting nature of its activities.[38] However, forest clearance under the Forest Conservation Act 1980 will be necessary in the event the Distribution line passes through forest areas.

146. One of the factors considered in selecting the best and optimum substation site and associated distribution line route is avoidance of potential significant environmental impacts. In power Distribution projects, potential environmental impacts are confined in the right of way (ROW) while for substations, they are site specific.

147. Appropriate survey methods and good engineering practice have been used to select the best alignment but residual impacts associated with the project cannot be entirely avoided resulting from varying topographical locations that will be traversed by interconnecting distribution lines. An environmental management plan (EMP) and an environmental monitoring plan (EMoP) will help ensure that these residual impacts are mitigated and/or enhanced.

6.2. Pre-construction and Design Phase

6.2.1. Location of Substations and Distribution Line Routes

148. As discussed in chapter 5 (Analysis of Alternatives), 13 criteria for site selection and a 17-question checklist/questionnaire guide the selection of distribution line routes and substations, among others, to avoid significant adverse environmental impacts. As described in paragrapgh 84 to 87 under chapter-3 of project description on augmentation of existing 168 nos substation, as these are updrading / addition of transformers & additional feeders only in existing substations, no tree cut will be required in existing substations.

149. As described in paragrapgh 44 to 83 for construction of new sub-stations under chapter-3 of project description, these substations are not lie near any critical and sensitive environmental locations such as reserve forest, wildlife sanctuary, estuary,

[38] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).

important bird area etc. no religious, historical or ASI recognised sites lie in the these substation location. Also no trees will be cut during these substation constructions as the land is wasteland. No crop will be destroyed as there is hardly any vegetation in the these substation location as it comprises of wasteland on Government land Please refere deatlied Sub-station site analysis covering an Environmental Characteristics & features of proposed new 33/11 KVA substation sites provided in Appendix-VII.

150. As described in paragrapgh no 86 to 101 under chapter-3 of project description on installation of 100 KVA DTR & associated distribution lines generally follow the road easement. Final route alignment of distribution lines does not cross & passing near to protected reserves forests / national park / sancuaries and large settlements and other critical sensitive environmental areas. There is also no rail line & river coossing on the way of final alingment route.There will be a total of 1127 km for 623 km 11 kV lines & 504 km LT distribution lines under PPR-42-I & II for the DISCOM-West covering 14 nos districts in Indore & Ujjain Region. Also extra scope of 632.8 km 33 KVA distribution line for feeder birfucation will be required under PPR-41-I&II. Please refer Table no-6.1 shown details of distribution lines.

Table 6.1. Summary of Distribution Lines of Total Project Area

Summary Of Extra Distribution Lines under updated scope of ADB-3066	Distribution Lines (KM)		Total Distribution Lines (KM)
	Indore Circle	Ujjain Circle	
33 KVA Distribution Lines (Feeder Birfucation)	284	348.8	632.8
Sub-Total- 33 KVA distribution lines addition under PPR-41- I & II			632.8
11 KVA Distribution Lines (DTR) under PPR-42-I&II	210	413	623
LT Distribution (0.433 KV) Lines under PPR-42- I & II	171	333	504
Sub-Total- 11 KVA & LT distribution lines addition under PPR-42- I & II			1127
Total Extra Distribution Lines for updation of scope under ADB-3066	665	1094.8	1759.8

151. There are 5 wildlife sanctuaries in western MP. Based on these site selection criteria and checklist, forest, cultural and archaeological sites, sanctuary, protected and other ecologically-sensitive areas such as Ralamandal Wildlife Sanctuary in Indore was avoide which has nearest distance 15 km from nearest substation site at Nipania, Dist Indore (MP).

152. Aside from the site selection criteria and checklist used by the DISCOM-West in selecting the subprojects, the walkover survey/transect, which involves setting up of temporary tracks, helps determine the type of vegetation, type of structures and

settlements within the road easements, and natural physical features and public utilities that may be traversed by the interconnecting distribution line. Walkover surveys may cause short and temporary disturbance to local people within the ROW.

6.2.2. Choice of equipment and technology

153. All the 40 nos new 33/11 kV substations, inclusive of 8 nos changed location will be air insulated and not gas insulated. Air insulated substation (AIS) uses atmospheric air as the phase to ground insulation for the switchgear of the substation while gas insulated substation (GIS) uses sulfur hexafluouride (SF6) gas. SF6 has a dielectric strength higher than air and the phase to phase spacing is reduced resulting to a more compact substation that is particularly advantageous in an urban environment where space is expensive. However, SF6 is a potent greenhouse gas (GHG) with a global warming potential of 23,900 times compared to CO2. One of the disadvantages of the AIS substation is the overall size making it more attractive to locate in the rural areas and they are usually installed outdoor.

154. Additional work of installation of permanent 100 KVA DTR to replace temperory rental distribution transformer & associated 11 KV lines will be using Rabbit conductor on 8 mt long PCC pole & LT using AB cable on 8 mtr long PCC poles. This is standard & widely accepted method of distribution lines with heigh of pole makes ensure safe for underline vegitations.

6.2.3. Land Acquisition For The Sub-stations

155. All 40 nos proposed substation sites, inclusive of 8 nos changed location of the DISCOM-West are on government land so there is no need for land acquisition from private owners. Substation sites that were initially evaluated as technically suitable but located on private lands that would entail land acquisition, physical and economic displacement of local people were not considered. Given the available government land in MP, the use of AIS will not be a major constraint.

156. Additional work of installation of permanent 100 KVA DTR to replace temperory rental distribution transformer & associated distribution 11 KV & LT lines will not required land aquistion, it will be executed along the road & avoid farming areas.

6.3. Construction Phase

157. During this phase, some activities may include clearing of ROW, setting up of temporary access tracks, setting up of materials storage areas along the route and substation work sites, transport of material and equipment to the site, excavation for

substations, installation of poles and conductor stringing. PMU of DISCOM-West will ensure that the contract of the Engineering, Construction and Procurement (EPC) Contractor(s) will include the obligation to compensate for any temporary damage, loss or inconvenience as result of the project during the construction phase.

6.3.1. Prepare Construction Management Plan

158. The construction management plan (CMP) will help in avoiding the unplanned activities of EPC Contractor(s) and will guide the smooth implementation of earth-moving works, civil and electrical works. The CMP will cover temporary pedestrian and traffic management, community and safety, spoils or muck disposal, noise and dust control, drainage and stormwater management, material management, and waste management. The CMP will also include designate sites /areas for monitoring such as workers facilities, work areas, and materials warehouse/ storage.

6.3.2. Hiring of Project Staff And Workers

159. The implementation of 40 nos new substations and 168 nos existing substations for upgrading will be opportunities for local employment. While this is beneficial, it may also be a cause of conflict due to migration of workers and dispute over transparency of hiring particularly if migrant workers are recruited over local people. The EPC Contractor(s) will be required to use local labour for manual work and eligible local workforce for technical and administrative jobs. DISCOM-West-PMUs will monitor the compliance to priority of local hiring.

6.3.3. Orientation for EPC Contractor(s) And Workers

160. PMU of DISCOM-West will conduct briefing and/or orientation for EPC Contractor(s) on the environmental management plan (EMP), grievance redress mechanism, consultation, and reporting. This will provide an understanding of their responsibility in implementing and compliance to the EMP as well as agreement on critical areas that needs monitoring. The briefing will also include strict compliance against child labour, bonded or forced labour, and awareness about socially transmitted disease such as HIV/AIDS to prevent potential incidence. Aside from relevant national and state labour regulations, ADB"s core labour standards will provide guidance for compliance. EPC Contractor(s) will provide training/drills on emergency preparedness and exercises before start of work will be encouraged to maintain health and fitness.

6.3.4. Presence of Workers At Construction Sites

161. The presence of workers and staff at the 40 nos new 33/11 kV substation construction sites and 168 existing substations for upgrading may increase demand for services such as housing, food, etc. This localized demand may be an opportunity for local people to have temporary small-scale business in providing services such as food, temporary lodging, etc. This will be a beneficial impact to local economy.

6.3.5. Site Preparation And Construction Of Substations

- ***Impacts on land and vegetation***

162. Vegetation clearing may cause some loss of habitat. Most of the substation sites are on grassland/shrubland such as in Santhla. Achalpura etc. No protected area, sanctuary or forest will be affected. Construction works will not be scheduled during harvest time to minimize damage to cash crops. The destruction and/or loss of habitat due to clearing and to stringing of distribution lines will naturally regenerate in about 2-3 years.

163. Earthmoving works in substation sites may cause potential erosion and localized flooding such as in Nayagaon with elevation lower than the street level. Adequate erosion control measures will be provided in areas located in sloping terrain (or as needed) and spoils disposal plan will be strictly implemented to prevent localized flooding.

164. Site preparation for 33/11 kV poles will be minimal earthworks compared to poles. Preparation for poles involves small-scale excavations and the excavated topsoil will be used for backfilling. For substations, wherever necessary, downhill slopes will be provided with revetments, retaining walls or sow soil binding grass around the sites to contain soil erosion. Landscaping/replanting/revegetation will be done as soon as earthworks are completed to stabilize the soil.

165. For distribution poles, only the exact amount of construction materials (i.e., sand, gravel, concrete, etc.) will be brought on-site to avoid stockpiling that may cause localized flooding during the monsoon season and to minimize any inconvenience to local people. At substation sites, adequate storage for materials needed for construction works will be provided.

166. Crops that may be affected or damaged during the installation of distribution poles and stringing of distribution lines will be compensated based on entitlements following the national laws and SPS 2009. Existing approach roads such as in Sandla may require upgrading and/or rehabilitation to facilitate construction. This will benefit not only

DISCOM-West operations but local people as well who will use the roads.

- ***Impacts on people***

167. There will be 168 nos existing 33/11 KV substations that will be upgraded which may require dismantling of structures and equipment and/or installation of new Distribution transformers. Workers assigned to dismantling works will be provided with proper safety clothes and protection gear/equipment to avoid accidents. Debris and scrap materials from dismantling activities will be transported to DISCOM-West warehouses located in Indore, where there would be dedicated storage yards, for resale and auction to authorized dealers. Similarly, servicing and/used transformer oil (if any) will be disposed of/sold to Government-registered recyclers only as set forth by the Hazardous Waste Management and Handling Rules 2008. MP has a common treatment, storage and disposal facility located in Pitampur, Dhar District. EPC Contractor(s) will be required to observe and implement the construction waste management plan. PMUs of DISCOM-West will monitor compliance.

168. The installation of distribution poles as well as stringing of conductors may potentially interfere with road crossings that may pose safety risks to the public and construction workers. To minimize the risks, adequate danger and clearly visible warning signs will be posted at designated sites while scaffoldings will be placed over road crossing points. EPC Contractor(s) will be required to instruct drivers of construction vehicles to strictly follow road regulations and to implement the temporary pedestrian and traffic management plan. Appropriate permits from the local authority will be obtained prior construction works. Security personnel will be assigned to prevent trespassing and accidents at the substation sites.

169. Local hiring will be given priority so workers can come home after work every day. However, if required, EPC Contractor(s) will provide construction camps with sanitary facilities, wash areas, safe drinking water, garbage bins, and designated security personnel. Designated staff will be provided with communication device to facilitate communication particularly during emergency.

170. EPC Contractor(s) will find the location of the nearest hospital and will make arrangements in case of accidents in the worksites. First aid treatment will be set up within the construction sites and field offices. Workers will be provided with hard hats, safety shoes, and safety belts while designated staff will be provided with communication devices. Health personnel (or a nurse) will be assigned by EPC Contractor(s) to visit the construction sites once a week to broadly check the sanitary

conditions of the construction sites and overall health condition of workers to minimize outbreak of diseases. Good housekeeping will be enforced at all times and will be monitored by PMUs of DISCOM-West. The Contractor(s) will comply with relevant safety measures required by law and best engineering practices.

- ***Impacts on air quality, noise and vibration***

171. The use of heavy equipment and construction vehicles may increase vehicular emissions at and around the substation sites. Vehicular emissions, land clearing, earthmoving works and transport of construction materials may increase levels of suspended particulate matter affecting air quality. Opened and exposed land areas at the substation sites and distribution poles will be sprayed with water to suppress dust level particularly during the summer season. Construction sites for substations will be temporarily enclosed to contain dust dispersion. EPC Contractor(s) will be required to maintain construction vehicles regularly to minimize the contribution of vehicular emissions to poor air quality. Warehouse for construction materials will be provided onsite to reduce the trips of material delivery while construction vehicles transporting materials that generate dusts will be covered.

172. Aside from vehicular emissions, the use of heavy equipment, construction vehicles and civil works may increase the noise levels while excavation works at the substation sites may induce vibration. Increase in noise levels and potential vibration may inconvenience local people living at and around these sites. As required by MPPCB guidelines (February 2013), noise-generating activities will be scheduled between 7AM and 7PM while noise-generating machineries and construction areas will be covered with acoustic screens and/or temporary enclosures. Drivers will be required to observe low speed wherever necessary and no blowing of horns. EPC Contractor(s) will ensure that the traffic management plan as well as air quality and noise control plans are implemented. PMUs of DISCOM-West will monitor compliance.

- ***Impacts on water quality***

173. Presence of workers at construction sites will generate sewage that may affect water quality while earth moving works may cause localized flooding during monsoon season and in other low-lying areas. EPC Contractor(s) will provide workers with sanitary facilities and safe drinking water. The site selection of subprojects avoided waterways to minimize the costs of mitigating the associated environmental impacts. To avoid localized flooding, construction works will be scheduled during summer in areas potential to flooding and during the monsoon season, drainage and stormwater

management plan will be implemented by EPC Contractor(s). PMUs of the DISCOM-West will monitor compliance to these measures.

6.4. Operation Phase

6.4.1. Presence of Distribution Poles And Substations

- ***Impacts on land and vegetation***

174. The presence of substations and distribution poles may lower the real estate property values near or adjacent to these facilities. However, the availability of a stable and reliable power supply will attract and promote local economic development and thus, may actually enhance property values.

175. While no subproject is located near or adjacent to the national parks and wildlife sanctuaries, birds and other wildlife may be attracted to the presence of substations and distribution poles particularly migratory birds. Distribution lines are designed to have ground wire spacing and lightning arresters as safety features to generally protect the public (and birds). Spot checks/ocular inspection of wildlife crossing and bird electrocution (if any) will be included as part of maintenance work along the distribution lines. Maintenance workers will be trained to create awareness on this monitoring.

- ***Impacts on noise***

176. Substations may cause disturbance to settlements adjacent to it due to noise generated by its operation. To minimize the impact, noise-generating equipment will be enclosed (if needed) and periodic maintenance of equipment such as transformers will be conducted.

- ***Impacts on people***

177. The presence of distribution lines, poles and substation may pose potential hazards such as electrocution, lightning strike, etc. due to accidental failure of power distribution Distribution. To ensure safety, distribution line poles are equipped with galvanized groundwire for earthing purposes.

178. Distribution line systems are designed with protection system that shuts off during power overload or similar emergencies. Indian and international electrical standards will be complied with by DISCOM-West at all times. There will be regular monitoring and maintenance to ensure safety and integrity of power lines and substations.

179. After more than 20 years of global research, concerns on the potential risks of cancer from exposure to electric and magnetic field (EMF) from overhead Distribution lines and

substations continue. In the Philippines, the Bureau of Health Devices and Technology of the Department of Health measured on 19 April 2004 the strength of electric and magnetic field generated by a 138 kV double circuit Distribution line and from transformers in the substations as follows:[39]. Table 6.2 presents an Exposure to electric and magnetic field (EMF) from overhead transmission lines

Table 6.2. Exposure to electric & magnetic field (EMF) from overhead transmission lines

Type of exposure	Centreline on 132 kV line	Conductors of 132 kV line	Limit of exposure for the general public, stilupated by International Commission on Non-ionizing Radiation Protection (ICNRP)
Magnetic field, milliGauss (mG)	0.813	0.823	833
	150 MVA transformer	**50 MVA transformer**	
Electric field, kV per meter	1.891	0.148	4.17
Magnetic field, mG	15.75	4.71	833

180. The results shown above suggest that the EMF that may come from the 33/11 kV substation and distribution lines will not be expected to exceed the limits set by the International Commission on Non-Ionizing Radiation Protection (ICNRP) which is 4.17 kV/m for electric field and 833 mG for magnetic field. Therefore, the substations and power Distribution lines are not expected to pose health risks to the public. The substations will be fenced and security staff will be assigned to prevent unauthorized public access. Appropriate warning signs will be posted at designated areas. DISCOM-West will conduct information and education campaign to local people to enhance awareness on living safely near the substations.

181. Working on elevated position during maintenance of distribution lines may also pose occupational and safety risks to workers. To minimize risks of accidents, maintenance workers/linemen will be provided with safety clothing and other working gears for protection, provide training on safety and emergency preparedness, and implement a safety plan.

182. The operation of the 40 nos new 33/11 kV substations, including additional work of installation of permanent 100 KVA DTR to replace temperory rental distribution transformer & associated 11 KV lines will create employment to local people. Aside from employment, there will be a stable and reliable supply of power, and improved delivery of service.

[39] Notification in the Gazette of India, Extra-ordinary part II and section 3, subsection II, 14 September 2006).

6.4.2. Management of Mineral Oil For Transformers & Discarded Batteries

- ***Impacts on land and water***

183. The use of transformers may cause potential accidental spillage that may contaminate land and water. The substations will have an oil-water separator and will have oil-containment structure/basin at the workshop areas.

184. Discorded oil from transformers of substations wil be drained & collected out carefully &, separately to avoid spillage / leakages to protect soil / water containmentaton. These discoarded used oil fall in waste category no-5.1 of Hazardous Waste (M, H & TBM) Rules 2008 & amendements. This used oil is recyclable through authorized recyclers / NOC by CPCB & consent given by MPPCB. Discarded used oil from transformers of substsation will be sent centralized store of DISCOM-West for auction to authorized oil recyclers of CPCB for disposal in environmentally sound manner.

185. Procurement of batteries for requirements of substations will be lead free batteries only to protect environment. However batteries management govern for bulk consumers, who purchase more than 100 batteries per annum under the Batteries (Management & Handling) amendment rules 2001 & amendments. These discarded batteries will be collected back by dealer / suppliers/ manufacturers. Discarded batteries from substsation will be managed through centralized store of DISCOM-West for safe disposal in as per provision of above said act.

- ***Impacts on people***

186. Use and handling of mineral oil for transformers may pose occupational and health risks to workers due to exposure. Delivery and acceptance of mineral oil will be accompanied by material safety data sheets and/or be certified that it is polychlorinated biphenyl-free. Fire extinguishers will be posted at designated locations in the storage areas for mineral oil. Workers will be provided with training on emergency preparedness.

CHAPTER

7. PUBLIC CONSULTATION AND INFORMATION DISCLOUSER

187. Initial consultations were done during the site visits on July 23-26, 2013 and a total of 48 persons were consulted. Further consultations for updation of IEE were held in January 2018 at the changed site location of new 33/11 kV substation sites, augmentation & upgradation of existing substations, 33 KVA distribution lines for additional feeder bifucation & 100 KVA DTR & assoicted 11 KVA & LT distribution line sites like Rui, Santhla, Nipania etc. Photographs of public consultation are given in Appendix-IX and sample attendance sheet for some substation sites are given in Appendix -X. Concerns of local people were common and they include:

(i) Load shedding and lack of reliable and stable supply of power affecting their produce and livelihood, and

(ii) Timely compensation to farmers affected during construction of substations, erection of the distribution transformers & PCC poles, and stringing of the distribution lines. The summary of public consultation is given in Table no-7.1 of Indore Region & Table no 7.2 of Ujjain Region.

Table 7.1. Summary of Public Consultation held in IEE updation of Indore Region

Sr. No	Name of Circle	Site Location	Date of Consultation / Date of Visit	No. of Participant (Nos)	Feedback
1	Indore City	South Div Office	18.09.2017	4	People are aware of the project. People enquired about shut down timings and if they will be informed in advance about same. Assured that shutdown timings will notified in advance
2		Nipaniya	18.09.2017	2	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP
3		Sector E	19.09.2017	8	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP
4		Chhota Bangarda	19.09.2017	4	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP
5	Indore O & M	Avlai	18.09.2017	9	People are aware of the project. No major concerns were expressed except related to compensation for crop damaged during project activity. Assured that as per DISCOM-West

					practise, a grievance can also be filed in case of any malpractice
6		Kishanganj	20.09.2017	4	Some people wanted to know if construction can be carried out during non cultivation season. Assured that it is followed by EPC contractor
7		Khalkhala	19.09.2017	5	People are aware of the project. No major concerns were expressed except related to compensation for crop damaged during project activity. Assured that as per DISCOM-West practise, a grievance can also be filed in case of any malpractice
8	Khandwa	Nawali	14.11.2017	3	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP
9		Bilankheda	14.11.2017	4	People are aware of the project. No major concerns were expressed except related to compensation for crop damaged during project activity
10	Burhanpur	Talawadi	16.11.2017	4	No major concerns expressed by project sorrounding people
11		Collector office Town	16.11.2017	5	No major concerns expressed by project sorrounding people
12	Khargone	Mohammadpur	19.11.2017	4	No major concerns expressed by project sorrounding people
13		Hirapur	19.11.2017	3	Some people wanted to know if construction can be carried out during non cultivation season. Assured that it is followed by EPC contractor
14		Nilkanth	19.11.2017	4	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP
15		Bhangaon	19.11.2017	4	No major concerns expressed by project sorrounding people
16	Barwani	Rakhi Bujurg	21.11.2017	5	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP
17	Dhar	Kabarwa	23.11.2017	3	People are aware of the project. No major concerns were expressed except related to compensation for crop damaged during project activity
18		Narwali	23.11.2017	4	No major concerns expressed by project sorrounding people
19		Kawada	23.11.2017	4	Some people wanted to know if construction can be carried out during non cultivation season. Assured that it is followed by EPC contractor
20		Phoolgawadi	23.11.2017	5	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP
21	Jhabua	Badikhattali	26.11.2017	3	No major concerns expressed by project sorrounding people
22		Mohan Kot	26.11.2017	4	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP

Table 7.2. Summary of Public Consultation held in IEE updation of Ujjain Region

Sr. No	Name of Circle	Site Location	Date of Consultation/ Date of Visit	No. of Participant	Feedback
1	Ujjain	Rui	13.09.2017	7	Some people wanted to know if construction can be carried out during non cultivation season. Assured that it is followed by EPC contractor
2		Banjari	13.09.2017	4	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP
3		Sandla	13.09.2017	11	No major concerns expressed by project sorrounding people
4		Palduna	13.09.2017	5	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP
5	Dewas	Thuria (Seti)	06.11.2017	4	No major concerns expressed by project sorrounding people
6		Gada Gaon Nimasa	06.11.2017	3	Some people wanted to know if construction can be carried out during non cultivation season. Assured that it is followed by EPC contractor
7		Neori Phata	06.11.2017	3	No major concerns expressed by project sorrounding people
8	Shajapur	Siroliya	08.11.2017	4	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP
9		Tajpur Ukala	08.11.2017	5	No major concerns expressed by project sorrounding people
10		Dharola	08.11.2017	5	Some people wanted to know if construction can be carried out during non cultivation season. Assured that it is followed by EPC contractor
11	Ratlam	Piplodi	10.11.2017	3	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP
12		Mamatkheda	10.11.2017	5	People are aware of the project. No major concerns were expressed except related to compensation for crop damaged during project activity
13	Mandsaur	Jamalpura	13.11.2017	3	People were apprehensive about construction activities and if they would cause nuisance. Assured that best practices are incorporated as per EMP
14		Kotdabahadur	13.11.2017	4	Some people wanted to know if construction can be carried out during non cultivation season. Assured that it is followed by EPC contractor

15		Garoda	13.11.2017	5	No major concerns expressed by project sorrounding people
16	Neemuch	Khankhedi	20.09.2017	4	People are aware of the project. No major concerns were expressed except related to compensation for crop damaged during project activity
17		Barkheda	20.09.2017	4	People are aware of the project. No major concerns were expressed except related to compensation for crop damaged during project activity
18		Anchalpura	20.09.2017	3	No major concerns expressed by project sorrounding people

188. Local people are aware of the proposed project and are generally supportive due to expected benefits. Consultations with project stakeholders in varying degrees will continue throughout the life of the project. The proposed consultation plan during implementation is given in Table 7.3.

Table 7.3 Public Consultation Plan during Implementation

Project Activity	Approach for Consultation	Schedule
Detailed survey (i.e., walk-over and contractor)	Informal meetings at different spot along the Distribution line route (approx. 20-30 km)	Pre-construction stage
Construction works	• Project brief and/or frequently asked questions (FAQs) in Hindi to be made publicly available in DISCOMs PMU field offices • Village or local informal meetings as needed	Construction Stage
Operation & aintenance	• Flyers or information leaflets particularly on safety issues such as electric and magnetic field, maintenance of ROW, pilferage or theft of power cable, etc. • Press releases as and when needed • Response to public inquiries	Operation Stage

189. The updated IEE will be posted to the website of ADB as required by SPS 2009 and Public Communications Policy 2011. A project factsheet or a frequently asked questions flyer in Hindi will be made available to the public at the DISCOM-West-PMU field office. The flyer will include among others, the information on grievance redress mechanism. Aside from these public disclosure requirements, the Right to Information Act 2005 of GoI also provides for additional obligation to DISCOM-West to provide information about the project. Hindi translation of updated IEE report"s executive summary and EMP will be disclosed by the client, which will provide relevant environmental information in a timely manner, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.

CHAPTER

8. GRIEVANCE READRESS MECHANISM

190. **Current Scenario:** The DISCOM-West has their own process of handling complaints / grievance from their customers about the quality of delivery service. As well, DISCOM-West has an online complaint logging system and a Vigilance Cell for the same issues which do not include safeguards issues on project implementation. In case the issue is related to land, the Revenue Department of MP will be in charge of filing the complaint on behalf of the affected person(s) and submit the complaint to the concerning Nodel Officer of the DISCOM-West. To address the limitation, the PMUs of the DISCOM-West will establish a grievance redress mechanism (GRM) to handle complaints and/or grievances on safeguards issues associated with the implementation of the subprojects of DISCOM-West. Plesse refer circular of GRC committee formation in Appendix-X.

191. **Goals:** GRM shall provide an accessible platform for receiving and facilitating resolution of affected person"s grievances related to the project/ subproject. According to SPS 2009, the GRM will address concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate and readily accessible to the affected persons at no costs and without retribution. GRM is normally incorporated in the compensation process due to land acquisition and temporary damages to crops and lands during construction but will also cover issues that may be raised on environmental issues such as increased level of dust and noise causing inconvenience to local people, traffic, or other relevant issues.

192. **Composition:** The GRM will have a grievance redress committee (GRC) set up by PMU in DISCOM-W as soon as the project commence and will continue to function from construction to operation phase. The GRC will consist of representatives from the local *Panchayat* Head, a District Revenue Commissioner, representative from the EPC Contractor(s) only during construction phase, designated staff on safeguards in the PMU of DISCOM-West, Director/ Nodel Officer of PMU in DISCOM-West, and a witness of the complainant/affected person. PMU in DISCOM-West will ensure the representation of women in the GRC.

193. **Responsibilities:** The GRC is expected to: (i) resolve issues on land acquisition (if any), compensation to temporary damages to crops and plants, and other use of land such as borrow areas for Distribution poles and substations; (ii) convene twice a month to review complaints lodged (if any), (iii) record the grievances and resolve the issues within a month (30 days) from the date the grievance was filed, (iv) report to the complainant(s) the status of grievance resolution and the decisions made.

194. **Procedures:** Minor grievances on compensation or environmental issue during construction will be resolved onsite through the EPC Contractor(s) Project Site Engineer. As a formal process of grievance resolution, the procedure is given below and described in Figure 8.1.

i. Affected persons (APs) will be informed in writing by DISCOM-PMU (or designated representative) of the damages and entitlements for compensation. If the APs are satisfied, compensation can be claimed from DISCOM-PMU through the EPC Contractor(s). If the APs are not satisfied, they can request for clarification from DISCOM-PMU. If the APs are not convinced with the outcome, they can file the grievance to the GRC with the help of the DISCOM-PMU who will provide the written documentation.

ii. The GRC will conduct a hearing of the grievance in the presence of the APs and will provide a decision within 15 days from the receipt of the complaint. Minutes of the meeting will be approved by the DISCOM-PMU and provided to the APs including the decision made by the GRC. If the APs are satisfied with the GRC decision, they can claim the compensation from the DISCOM-PMU and/or EPC Contractor(s).

iii. If the issue(s) remains unresolved, the case will be referred by the GRC to the appropriate Court of Law for settlement.

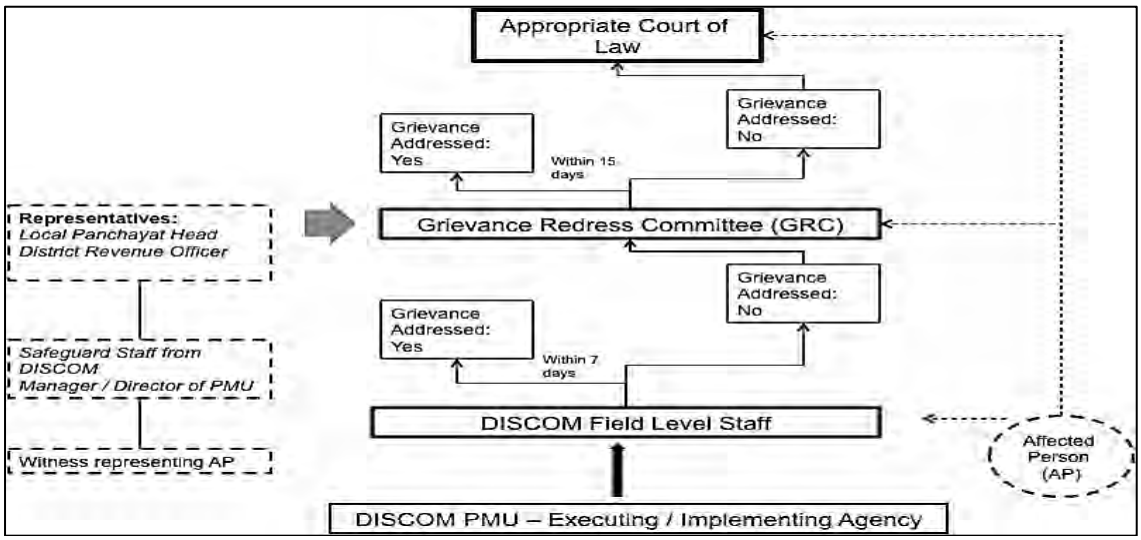


Figure 8.1. Processes for Grievance Redress Mechanism in the DISCOM-West

195. **Area of Jurisdiction:** GRC shall be set up at the *Panchayat* level where subprojects are proposed under DISCOM-West.

196. **Record-keeping:** Records shall be kept by the DISCOM-W-PMU of all grievances received including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date these were effected, and final outcome. Documentation of the grievances filed and resolved will be summarized and included in the semi-annual monitoring reports submitted to ADB during construction stage and annually during operation stage. Records of grievances are not recorded till project executed. The PMU shall observe that records of grievances are maintained regularly, if come in notice.

197. **Disclosure of Information:** DISCOM-W-PMU will inform the APs on grievance redress procedure, who to contact and when, where and how to file a grievance, time likely to be taken for redressal of minor and major grievances, etc. Grievances received and responses provided will be documented and provided to the APs during the process. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the field offices of DISCOM-W-PMU and offices of the concerned local *Panchayat* and District Revenue Office (if required).

198. **Review of the Process:** DISCOM-W-PMU will periodically review the implementation of the GRM and record information on the effectiveness of the mechanism, especially on the project‟s ability to prevent and address grievances.

199. **Cost of Implementation:** Costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by DISCOM-West-PMU. The cost of implementation will be taken from the administration cost included in the total cost of the resettlement plan (RP) for the project. If the administration cost is not adequate, the budget will be taken from the contingency cost of the RP.

CHAPTER

9. ENVIRONMENTAL MANAGEMENT PLAN

9.1. Mitigation Measures

200. The mitigation measures for the corresponding environmental impacts identified are presented in Table 9.1. The environmental management plan (EMP) will be updated before the start of civil works, and as needed, to accomodate any change in the condition of the site or alignment of the distribution line after the contractor survey, performance of EPC Contractor(s), and feedback from local people or other stakeholders (if any).

9.2. Environmental Monitoring

201. During the construction stage, environmental monitoring will be a half yearly process to ensure that non-compliance to the EMP by the EPC Contractor(s) if any will be avoided and/or immediately addressed. The results of monitoring will be submitted to ADB twice a year during construction and annually during operation as required by SPS 2009. Baseline data for environmental parameters such as air and noise is not available but will be carried out and recorded by contractor before commencement of civil works.

202. Monitoring and maintenance of the power Distribution system during operation ensure the integrity and safety of the structures and components, thus, minimizing safety risks to the public and damage to properties. Table 9.2 gives a summary of the environmental monitoring plan.

9.3. Implementation Arrangements

203. Currently, DISCOM-West has a PMU responsible for procurement, feasibility assessments, and bid planning. PMU staffs are aware of safeguards issues and compliance but there is no staff designated to deal with these concerns. The Madhya Pradesh Paschim Keshtra Vidyut Vitaran Co. Limited, Indore (DISCOM-West) will serve as the executing agencies (EAs) and implementing agencies (IAs) for the project. DISCOM-West has established project management units (PMUs) to implement the ADB loans in Distribution System Improvement Program. They will continue as PMUs of the proposed project.

204. Field level staff/engineer will be deputed at divisional level who will assume primary responsibility as Nodel Officer for the environmental and social assessment as well as

implementation of RPs for their respective components. Keeping in view the capacity of DISCOM-West and its existing PMU, it is proposed that each PMU will designate a Overall implementation of the EMP will be carried out under the supervision of the Project Director-ADB/ Nodel Officer-PMU. A Nodel Officer (or a Consultant), who will be primarily responsible for ensuring that the EMP is properly implemented, will be deputed for the project prior to award of the civil works contract. Nodel officer will coordinate and interact with Project Director-ADB/PMU on compliance to ADB requirements, relevant government agencies and local authorities on permits (as needed), update and finalize the draft IEE, and will prepare environmental monitoring reports for submission to ADB at least twice a year during construction and annually during operation. The Nodel Ofiicers/ PMUs will be responsible for managing the site activities related to safeguards and will work closely with the field level staff.

205. EPC Contractor(s) will be informed of their responsibility to comply with the EMP and the requirements of ADB. There are specific responsibilities for EMP compliance during construction phase that will rest with the Contractor who will be monitored by the Nodel officer / environmental consultant of the project.

9.4. EMP Budget:

206. As part of good engineering practices in the project, there have been several measures as safety, signage, dust suppression, procurement of personal protective equipment, provision of drains, etc. and the costs for which will be included in the design costs of specific subprojects. Therefore, these items of costs have not been included in the IEE budget. Only those items that are not covered under budget for construction are considered in the updated IEE budget.

207. This project is not expected to cause much significant air, water and noise pollution. However, as per the environmental monitoring plan, routine environmental quality monitoring shall be conducted by the PMC/ Contractor through an NABL accrdiedated /MoEF approved under EPA act 1986 / MPPCB authorised montoring agencies. For distribution lines, there will not be major issues as only small foundations are dug for each PCC pole but for substation sites, moderate civil works are carried out, hence environmental quality monitoring becomes a necessity. The costs of water sprinkling for dust suppression and providing personal protective equipment"s to construction workers shall be borne by contractor as part of conditions of contract. The indicative EMP cost is given in Table 9.3 and is based on rates listed on MPPCB / approved laboratories. The rates are calculated on biannual monitoring basis

Table 9.1 Environmental Management Plan

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
Planning and Pre-Construction Stage					
Preparation of feasibility study and detailed project report (DPR) • Location of substation and distribution lines • Choice of equipment and technology • Change of location of 8 nos Substation out of original proposed 40 nos substation & augmentation • 100 KVA Distribution Transformers and Associated 11 KV distribution lines	• Land and vegetation	• Loss of agricultural land and crops • Loss of habitat and vegetation clearing • Land acquisition • Increase in soil erosion and impact to soil productivity	• Use of 13 criteria for site selection which include environmental factors to minimize potential impacts • Use of 17-question checklist /questionnaire in evaluating substation sites which aim at avoidance of land acquisition and environmental impacts • Substations are all on government land (40 nos- DISCOM-West) including 8 nos change of site locations • No land acquisition required but transfers of ownership from the government to DISCOM-West • 40 nos Substation of 33/11 kV (including change of 8 nos site location), additional 33 KVA distribution lines for feeder birfurcation and additional 1127 KM of 11 KVA & LT distribution line will not have impact on on environment & away from traverse forest, sanctuary, or protected areas • Use of mineral oil such as Duralife Transformer Oil for transformers (generally occurs in operation phase) • Use of air insulated substations to avoid fugitive emissions of SF_6 (a potent GHG gas)	Included in the Project Costs *Associated costs of land transfers from the Government will be borne by DISCOM-W	MP-DISCOM-W, District Commissioner Office
	• People	• Physical displacement of people and structures • Economic loss to people • Disturbance and inconvenience to people due to traffic, increased noise and dust levels, vibration • Interference to existing utilities			
	• Water	• Interference to local drainage • Water quality impacts due to erosion and/or sedimentation			
	• Air	• Increase dust and noise levels, and vibration • Emissions from heavy equipment machinery and construction vehicles			
Construction Stage					
Orientation for contractor and workers	• People	• Awareness of workers on the	• Conduct briefing of EPC Contractor(s) on EMP, records management,	Included in the costs of EPC Contractor(s)	EPC Contractor(s), PMUs of DISCOM-W

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
		environmental requirements and their responsibility • Understanding of EPC Contractor(s) of their responsibility in implementing the EMP	and reporting • Identify critical areas to be monitored and the required mitigation measures • Create awareness of sexually-transmitted diseases such as HIV/AIDs		Environmental staff/consultant in PMU
Prepare construction management workplan	• People • Land • Air • Water • Waste	• Avoid effects of EPC Contractor(s) unplanned activities • Smooth work implementation	• Temporary pedestrian and traffic management plan • Community and safety plan • Spoils disposal plan • Noise and dust control plan • Drainage and storm water management plan • Materials management plan • Construction waste management plan	Included in the costs of EPC Contractor(s)	EPC Contractor(s), PMUs of DISCOM-W Environmental staff/consultant in PMU
Hiring of project staff and workers	• People	• Conflict due to potential workers‟ migration • Lack of local support to the project • Dispute over transparency of hiring	• EPC Contractor(s) will be required to use local labour for manual work and eligible local workforce for clerical and office jobs	---	EPC Contractor(s), PMUs of DISCOM-W Environmental staff / consultant in PMU
Presence of workers at construction sites	• People	• Increase in demand for services such as food, temporary housing, etc. • Create opportunities for small-scale business to provide services such as food, temporary housing, etc.	• None required	---	---
• Site preparation, vegetation and land	• People	• 33/11 kV substations (40 sites) & distribution	• Construction management plan will be strictly implemented • Use of proper safety	Included in the costs of EPC Contractor(s)	EPC Contractor(s), PMUs of DISCOM-W

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
clearing for substations and Distribution line right-of-way (ROW) • Construction of substations, installation of required equipment at substations, erection of Distribution poles and stringing of conductors		lines	clothes/equipment in dismantling structure(s) and equipment • Debris/dismantled structures/equipment will be disposed of in designated landfill and/or controlled dumpsites • Usable scrap materials from dismantling will be stored in warehouses of DISCOM-W in Indore for resale/auction		Environmental staff / consultant in PMU
		• Potential safety risks to community	• Provide fence or barricade (as appropriate), sufficient lights, clear warning signs and danger signals, and take all precautions identified in the community and safety plan • Assign security personnel to prevent accidents, trespassing, and pilferage • EPC Contractor(s) to direct drivers to strictly follow road regulations		
		• Interference with road crossings	• Danger and clearly visible warning signs will be posted at designated sites • Scaffoldings will be placed over road crossing points • Construction vehicles to strictly follow road regulations • Implement temporary pedestrian and traffic management plan		
		• Potential health and safety risks to workers	• Provide sanitary facilities and wash areas • Provide safe drinking water and garbage bins • Enforce good housekeeping at all times • Provide workers with hard hat, safety shoes and belts • Coordinate with nearest hospital for arrangements in case of accidents • Assign nurse or medical staff to make		

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
			weekly rounds at substation sites • Set up first aid treatment within construction sites and field office • Observance and compliance with relevant safety measures required by law and best engineering practices • Provide communication devices to designated workers		
	• Land and vegetation	• Erosion and localized flooding (e.g., 33/11 kV substation) • Loss of habitat and some mature trees of economic value such as teak (e.g., 33/11 kV substation)	• Compensation for temporary damages to crops/plants along the ROW and substations • Cut trees owned by the government will be sold and revenue turned over to Revenue Authority • Only minimal vegetation will be cleared since most of the substation sites are grassland/shrubland (e.g.) • Landscaping/replanting of trees at new subs-stations will be done after completion of construction works • Erosion-control measures will be provided (as needed) • Implement spoils disposal plan and construction waste management plan		
	• Water	• Generation of sewage from construction workers • Localized flooding • Increase turbidity in surface water near construction sites	• Avoidance of waterways in site selection • Provide sanitary facilities to workers and safe drinking water • Construction works will done during summer in areas potential for erosion and localized flooding • Implement drainage and stormwater management plan • Waterways were avoided in selecting subproject sites		

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
	• Air	• Heavy equipment and construction vehicles may increase vehicular emissions • Transport of construction materials to construction s sites may increase dust level • Earthmoving works, excavations, and opened land areas for substations and poles may increase dust levels • Increase in noise level and vibration from excavation and heavy equipment and construction vehicles	• Construction vehicles will be maintained to minimize vehicular emissions • Enclose construction sites temporarily to contain dust dispersion • Warehouse for construction materials onsite will be provided to reduce trips of material delivery • EPC Contractor(s) will be required to maintain construction vehicles and heavy equipment machineries regularly to reduce emissions • Opened land areas or sources of dust will be sprayed with water (as needed) • Transport of dust-generating materials will be covered • Observance of low speed by vehicles to reduce noise • Noise-generating works will be done between 7AM and 7PM done at daytime as required by EPA act 1986 & amendments. • Construction sites will be covered with acoustic screens and machineries will be temporarily enclosed to control noise (MPPCB guidelines, February 2013) • Require EPC Contractor(s) to maintain and tune-up construction vehicles to reduce noise and no blowing of horns • Observe/comply with traffic management plan		
Operation and Maintenance Stage					
Use of mineral oil for transformers	• Land • Water	• Accidental spillage that would contaminate land and water	• Provision of oil-water separator • Provide for oil containment structure	Included in the O & M costs of Project	MP-DISCOM-W
	• People	• Occupational health risks	• Acceptance of mineral oil should be		

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
		to workers due to exposure	accompanied with Material Data Safety Sheets and/or be certified that it is PCB-free • Fire extinguishers readily available in storage areas for mineral oil		
Presence of substations, power Distribution and distribution lines	• Land	• Depreciation of land property values adjacent to substations and power Distribution poles	• Availability of stable and reliable power will trigger economic development in the area	---	---
	• People	• Hazards such as electrocution, lightning strike, etc. due to accidental failure of power Distribution and distribution lines	• Provide security and inspection personnel to avoid pilferage and vandalism of equipment and lines • Appropriate grounding and deactivation of live power lines during maintenance work • Designed with protection system that shuts off during power overload or similar emergencies • Maintain and comply with electrical standards • Distribution lines entering and leaving the substations are insulated (or covered) to minimize impacts • Regular monitoring and maintenance to ensure safety and integrity of power lines and substations • Conduct information and education campaign to local people to enhance awareness on safety practices of living near substations	Included in the O & M costs of Project	MP -DISCOM-W
		• Accident working in elevated position	• Implement safety plan to reduce risks • Provision of safety belts and other working gears for protection	Included in the O & M costs of Project	MP-DISCOM-W
		• Potential exposure to electric and magnetic	• EMF levels expected to be way below the limits set by International	Included in the O & M costs of Project	MP-DISCOM-W

Project Activity	Environmental Component Likely to be Affected	Description of Potential Environmental Impact	Mitigation/Enhancement Measures	Estimated Cost	Responsible Unit
		fields (EMF)	Commission on Non-Ionizing Radiation Protection(ICNRP) which is 4.17 kV/m for electric field and 833 mG for magnetic field • Spot measurements of EMF • Substations will be fenced and security staff assigned to prevent unauthorized public access • Information and education campaign will be conducted to local people to create awareness on safety practices		
		• Generation of employment	• More than 80 positions will be created during the operation	---	MP-DISCOM-W
	• Noise	• Disturbance to settlements near the substations	• Periodic maintenance of equipment such as transformers and capacitors to minimize noise generation • Provide enclosure of noise-generating equipment • Monitor ambient noise levels	Included in the O & M costs of Project	MP-DISCOM-W

Table- 9.2. Environmental Monitoring Plan

Project Stage	Parameter/ Indicator	Location	Method of Measurement	Frequency	Responsibility (Implementation and Supervision)
Pre-Construction and Planning	Guaranteed noise level of equipment and machineries	Substation sites	Machinery and equipment specifications – compliance to ambient noise levels	Once	PMUs of MP DISCOM-W
	Soil quality	Substation sites and Distribution Poles	Sampling and chemical analysis	Once	PMUs of MP DISCOM-W
	Quality of transformer oil	Substations sites	Material Safety Data Sheet – compliance to IS:1866	Once	PMUs of MP DISCOM-W
	Loss of terrestrial and aquatic habitat	Substation sites	Ocular inspection, transect survey	Once	PMUs of MP DISCOM-W
	Proximity to water resources	Substation sites and distribution ploes	Ocular inspection, maps	Once	PMUs of MP DISCOM-W
	Routes of migratory birds	Substation and distribution poles	Ocular survey/observation, secondary data	Quarterly to capture seasonal variations	PMUs of MP DISCOM-W
Construction	Local recruitment of workers and staff	Substations, distribution lines, stringing of conductors	Number of local workers and staff recruited	Monthly	PMUs of MP DISCOM-W; EPC Contractor(s)
	Orientation of Contractor(s) and workers on issues like HIV/AIDS, compliance to EMP, etc.	Substations, distribution lines, stringing of conductors	Number of participants	Once before construction,	PMUs of MP DISCOM-W; EPC Contractor(s)
	Spraying of water to opened land areas before movement of construction vehicles	Substations and road easements affected by delivery of equipment and construction material; distribution poles (if needed); stringing of conductors	Ocular inspection/spot checks	• Weekly at road easements (or as needed) • Every day at substation sites during dry season	PMUs of MP DISCOM-W; EPC Contractor(s)
	Solid waste management	Substations, workers‟ camps, stringing of conductors, distribution poles	Ocular inspection/spot checks	Every week	PMUs of MP DISCOM-W; EPC Contractor(s)
	Danger and warning signs for safety of workers and the public	Substations and road easements affected by delivery of equipment and construction material; distribution poles; stringing of conductors	Ocular inspection/spot checks	Once a month	PMUs of MP DISCOM-W; EPC Contractor(s)

Project Stage	Parameter/ Indicator	Location	Method of Measurement	Frequency	Responsibility (Implementation and Supervision)
	Announcement to the public of works schedule	Substations; along the road easement affected by interconnections of distribution lines, poles, and stringing of conductors	Work schedule log sheet	As needed	PMUs of MP DISCOM-W; EPC Contractor(s)
	Erosion control measures such as silt traps	Substations, distribution poles	Ocular inspection	Once a month	PMUs of MP DISCOM-W; EPC Contractor(s)
	Smoke belching construction vehicles	Substations, tdistribution poles, and stringing of conductors	Ocular inspection/spot checking	Weekly	EPC Contractor(s), Environmental Staff of MP DISCOM-West-PMU
	Ambient Air Quality & Noise Level Monitoring	Within Substation premises.	Monitoring through MoEF approved Environmental Laboratories	Half Yearlly till completion of project.	PMUs of MP DISCOM-W; EPC Contractor(s)
	Housekeeping	Substations, distribution lines, workers" camps	Ocular inspection/spot checks	Weekly	PMUs of MP DISCOM-W; EPC Contractor(s)
Operation	Failure of Distribution poles and/or distribution lines	Along the alignment	Maintenance log sheet	Monthly	MP DISCOM-W
	Ambient Air Quality Monitoring	Within Substation premises.	Monitoring through MoEF approved Environmental Laboratories	Annually	PMUs of MP DISCOM-W; EPC Contractor(s)
	Occupational health, and safety	Substations, distribution lines	Number of accidents and/or injuries	Semi-annually	MP DISCOM-W
	Tree planting, maintenance of green landscape	Substations	Ocular inspection	Quarterly	MP DISCOM-W
	Housekeeping	Substations	Spot checks	Monthly	MP DISCOM-W
	Collection of waste (i.e., oil, garbage, etc.)	Substations	O & M log sheet	Monthly	MP DISCOM-W
	Bird collision / electrocution	Along the distribution poles and disribution alignment	Spot checks/oservation	Monthly	MP DISCOM-W
	Pilferage of cables	Along distrubtion poles and distribution lines	Ocular inspection; O&M log sheet (security operations)	Quarterly	MP DISCOM-W

Table- 9.3. Environmental Management Plan Cost

S. N.	Description	Project Monitoring Phase	Frequency	Qunatity	Unit Rate (INR)	Amount (INR)
1	**Environmental Parameters Monitoring**					
i.	Air Quality Monitoring: Parameters: PM10, PM2.5, SO2 & NOX as per NAAQS, 2009	Pre-construction: For each sub-station location (40 nos), baseline data will be generated once before commencement of civil works	40 x1	120	16500	1980000
		Construction: For each sub-station (40 nos) location, twice a year monitoring will be done.	40 x 2			
		Operations: As per Local Environmental Regulatory Authority directives				
ii	Noise Monitoring Parameters: Leq (Day), Leq (Night), Maximum Noise level.	Pre-construction: For each sub-station location (40 nos), baseline data will be generated once before commencement of civil works	40 x 1	120	15000	1800000
		Construction: For each sub-station (40 nos) location, twice a year monitoring will be done.	40 x 2			
		Operations: As per Local Environmental Regulatory Authority directives				
2	**Project Safegaurd Monitoring (EMR & SMR)**					
i	Hiring Environment Specilist	Preparing IEE, RP as per ADB directives @six monthly EMR & SMR , Project commencement to closing Project Duration- June 2014 to March 2018	2 x 1 & 2 x 5	12	150000	1800000
	Total Amount (Rupees Fifty Five Laces & Eighty Thousand Only)					**5580000**
	Add Contingencies @5%					**279000**
	Grand Total (Fifty Eight Lac & Fifty Nine Thousands Only)					**5859000**
Note: Environmental Monitoring Rate Source- MPPCB Labratories						

CHAPTER

10. ENVIRONMENTAL DUE DILIGENCE

208. The DISCOM-West was started implementation of subproject in June 2014 under ADB loan-3066-IND with priority of identification of project location and implementation of the project in a time bound manner. During the progress of subproject implementation, original scope of work has been updated / changed based on actual surveys & site conditions. Updated scope of work has been described in following subprojects going on as under:

- Total 40 no"s new 33/11 KVA substation was proposed for construction under original scope of work of IEE. During in progress of land acquisition & actual site condition, 8 nos site location of new proposed 33/11 KVA substation has been changed as shown name of changed site location in Annexure-IV under PPR-41-Lot-I & II, which is being executed by contractor M/s Bharat Electrical Contractors & Mfrs Pvt Limited, Sangli (MS). There is no increase of number of proposed construction of new 33/11 KVA substation, except original planned site locations due to non-availability of land at project concept stages. Also updated 632.8 km of 33 KVA distribution lines for additional feeder birfucation, which was not part of original scope of work of ADB approved IEE report September 2013 at project concept stages.

- Addition of scope of installation of total 1221 no"s 100 KVA DTR & associated distribution 11 KV lines length of 623 KM & LT line length of 504 KM as detailed scope of work mentioned in Annexure-IV under PPR-Lot-42-I & II, which are being executed by M/s. Shriam Switchgears Limited, Ratlam (MP). This is total additional scope of work, which was not part of original scope of work of ADB approved IEE report September 2013 at project concept stages.

209. Now total updated total scope of work has been summarized based on survey & shown in table no-3.1 in chapter-3 under project description. As per the cumulative progress of subprojects executed till December 2017 are approx. 82 % 100 KVA DTR with 11 KV distribution line and construction of new 33/11 KV substation with augmentation of existing substations have been completed with target of project to be completed by June 2018

210. This section ascertains presence of any residual environmental impacts due to implementation of works on account of changes in sub-station locations and other additional scope as described above, and suggests appropriate, time-bound corrective measures to address those residual environmental impacts. The various aspects that would be considered for such field-based environmental due diligence has been work out & elaborated in next paragraphs.

211. It has confirmed that contractor"s contract agreement includes EMP for implementation of subprojects of DISCOM-West under sub-clause-45 of section-8 of special condition of contract for work contract no MD/WZ/06/PUR/ADB-III/PTR/PPR-41and clause-9 of GCC under contractor responsibility for work contract no MD/WZ/06/PUR/ADB-III/DTR/PPR-42 for compliances of all applicable national, provincial & local environmental laws & regulations.

212. Status of statutory permission applicable for the sub-project(s), as per EIA Notification 2006 and its subsequent amendment of MOEF&CC, no environmental clearance is required for substation & distribution system. All subproject locations are in government wasteland & away from protected reserved forest. There is no requirement of forest clearance. Detailed status of statutory applicability are summarized and presented in table no 10.1.

Table 10.1. Status of Environmental Regulatory Requirements.

S. No.	Relevant Govt. Notifications /Rules	Compliance requirement under the Rule	Compliance Status
1.	EIA Notification 2006,as amended	All development projects listed in schedule 1 of EIA Notification Needs to get prior Environmental Clearance.	Power Distribution projects are excluded from the Schedule 1 of EIA Notification 2006
2.	Batteries Management and Handling Amendment Rules 2010	As per Rule 10(2),it shall be the responsibility of the bulk consumer to : (i)ensure that used batteries are not disposed off in any manner other than by depositing with the dealer/ manufacturer/ registered recycler /importer/ re-conditioner or at the designated collection centers,- and (ii) file half-yearly return in Form VIII to the State Board.	Will be disposed off as per the provisions of rules framed under EPA for disposal of scrap batteries through sale of authorized firm. Scraped equipment"s are disposed through Metal Scrap Trading Corporation (MSTS), a Govt. of India undertaking.

3.	Hazardous Waste (Management and Handling) Second Amendment Rules 2009	Used/burned transformer oils to be disposed off in accordance with the Hazardous Waste (Management and Handling) Rules	Used/burned oil of transformer is being disposed off as per the provisions of the Hazardous Waste (Management and Handling) Rules
4.	Ozone Depleting Substance (Regulation & Control) Rules 2000	Avoid equipment‟s using CFCs/PCBs as per Ozone Depleting Substance (Regulation & Control) Rules	CFCs and PCBs are not used in any equipment. The equipment‟s are as per latest BIS specifications that comply with international standards, particularly with respect to avoiding use of PCBs.
5.	Air Prevention and Control of Pollution Act,1981 with Rules	Compliance to National Ambient Air Quality Standard	The new substations being established or the existing sub-station under augmentation do not generate any trade effluent or air pollutant in to the atmosphere. The only potential impact assessed is increase in airborne dust particles due to construction of roads for accessibility if any. No construction of roads for accessibility, the existing roads and tracks are being used for construction and maintenance access under the project.
6.	Water (Prevention and Control of Pollution) Act 1974 with rules	Prevention and Control of Water Pollution	The new substations being established or the existing sub-station under augmentation do not generate any trade effluent in to the receiving waters. No new construction facility for construction workers involved that can cause contamination of receiving waters.
7.	Noise Pollution (Regulation & Control)Rules,2000	Compliance with Ambient Noise Standards in accordance to land use of the area	Construction techniques and machinery creating minimal sound disturbance that remains always within the permissible limits. No complaints received from the locals.
	e-Waste (Management & Handling) Rules 2011 (Effective form 1st may 2012)	Compliance with the responsibility entrusted to Bulk consumers of electrical and electronic equipment listed in schedule I of the rule in to maintain records of e-waste generated by the consumer.	E-Waste generated will be channelized to authorized collection center or registered dismantlers or recyclers or is return to the pick up or take back services provided by the producers.
	Fly Ash Notification, 2003	Responsibility on the construction agency to use Fly Ash based bricks/product, within a radius of 100 kms from a thermal power plant.	No major construction work envisaged in the project. No major thermal power plant located within a radius of 100 kms of project area.

213. Contractors involve in deployment of manpower for execution of subprojects under PPR-Lot 41 & 42 having valid labor license under Madhya Pradesh labor laws (Amendment) and Miscellaneous Provisions Act 2015 in state of MP. Both contractors also having

workmen compensation insurance policy for manpower engaged in construction site, including EPF, ESI & minimum wages applicable for contractor employees.

214. Executing agency is ensuring compliance of EMP mentioned in table no-9.1 by respective contractors" at different project stages during pre-construction, construction and operation stage of the sub-project(s). DISCM-west will continue monitoring of implantation of EMP by contractors for ongoing implementation of project & also in operation stages of subprojects. Compliance status of EMP as provided in the Table no.10.2.

Table 10.2. EMP Compliances Status of Project.

S. No	Proposed Mitigation Measure	Status of Implementation	Measures for Improvement
1	PCBs not used in transformers or other project facilities or equipment"s Processes, equipment and systems not to use chlorofluorocarbons (CFCs), including halogen Use of PCBs and CFCs in the existing systems should be phased out and to be disposed of in a manner consistent with the requirements of the government.	Transformers or other project facilities or equipment"s do not use PCBs.	Phased out materials are disposed off through approved agencies as per the provisions of hazardous Wastes Rules. Latest BIS or equivalent international standard is specified for all equipment"s and project facilities
2	Careful route selection to avoid existing settlements	As part of the detailed survey and line alignment selection, consultations with local people were carried out. New lines and substations proposed under this project are located without any impact on settlement.	Each circle CEO and contractor"s designated environmental officer are ensuring the same.
3	Involuntary resettlement or land Acquisition	Involuntary resettlement or land acquisition not required for this project.	NA
4	Avoid encroachment into precious ecological areas by careful site and alignment selection	No precious ecologically sensitive areas/wildlife sanctuary area is involved.	NA
5	Avoid encroachment into Forestland.	Reserve forest area involvement has not yet come to the notice.	NA
6	Avoid encroachment into Farmland	Detailed survey and line alignment selection were made with minimum or no impact on farmland.	NA
7	Better design to ensure noise will not be a nuisance	Latest BIS or equivalent national or international standards is specified for all equipment"s and project facilities,	NA

8	Appropriate placement of poles to avoid drainage/ channel interference	In majority of the cases, the line alignment finalized along the existing line without affecting the natural drainage During detailed survey, consultations were made with local people.	NA
9	Equipment specification with respect to potential pollutants	Equipment"s purchased under the project do not contain PCB or CFC. Latest BIS or equivalent international standards are adopted for the equipment"s and other project facilities.	NA
Construction			
10	Equipment specification with respect to potential pollutants	No heavy equipment"s are used in the construction works under the project. Line works involved some minor works like digging of pit, etc.	NA
11	Construction activities to be scheduled to avoid disturbance to farming activity	Works were carried out after harvesting to avoid any damage to farming activities. Contractors have been made responsible for ensuring avoidance of disturbance to farming activities. No complaint from farmers regarding damage of farming activities.	Contractors have been made responsible to maintain a channel of communication with the communities to address any concern or grievances and try to resolve it as soon as possible and also ensure the availability of register for public complaints at the site office.
12	Construction equipment to be well maintained and turn of the plant not in use to avoid noise, vibration and operator safety.	Equipment/vehicle is employed in the construction in the construction works. Project works are being carried out only during day time. No heavy equipment"s are used in the construction work.	EMP has been made part of the contract and the contractor has been made responsible for implementation of the EMP. Contractor will use equipment"s and vehicles complying with Environmental standards.
13	Existing roads and tracks used for construction and Maintenance should be used to access to the project site.	Established roads and tracks are being used, the contractors have not constructed any new access road for these project activities.	EMP has been made part of the contract and the contractor has been made responsible for implementation of the EMP.
14	Marking of vegetation to be removed prior to site clearance and strict control on clearance activities to ensure minimal clearances	Strict control observed on clearance activities by the project authorities to ensure minimal clearances.	

15	Trees allowed growing up to a height within the ROW by maintaining adequate clearance between the top of tree and the regulator as per the regulations. Trees that can survive pruning should be pruned instead of clearing.	No trees cut/removed for the project. Trimmings of branches of trees are to be required only as operation and maintenance activity.	EMP has been made part of the contract and the contractor has been made responsible for implementation of the EMP.
16	Construction workers prohibited from harvesting wood in the project area	Included on the bid document. No labour camps established for the project. Generally Contractor employs local Labors and used the facilities available on site.	
17	Dispose scrap materials such as batteries, transformers, conductors, capacitors etc in Environmentally sound manner	Having the authorization from MPPCB for the disposal of hazardous materials and scrap batteries. Scrap materials will be disposed off in accordance with provisions of applicable laws.	
18	Tree clearances for easement establishment to only involve cutting trees off at ground level	No trees cut/removed for the project.	
19	Excavated earth to be stored and reused for back filling	Minor civil construction works involved. Contract clauses specified the best management construction practices.	
20	Fuels and other hazardous materials to be stored above high flood level	Contract clauses specified the best Management construction practices.	
21	Noisy construction activities shall be carried out during day time	Project works are being Carried out only during daytime.	
22	Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities	No workers camp established. Local workers were employed as far as possible. No complaints received so far. Part of contract and the contractor has to implement it.	
23	Existing irrigation facilities are to be maintained Use existing access roads for transportation of materials Protect/preserve top soil and reinstate after construction completed Repair/reinstate damaged bunds etc after construction	Minor civil construction works involved, established roads and tracks are being used. The existing infrastructural facilities are maintained without damaging its originality.	EMP has been made part of the contract and the contractor has been made responsible for implementation of the EMP.
24	Take measures to prevent erosion and /or silt run off Limit site clearing to work area Regeneration of vegetation to stabilize work areas on completion Avoidance of Excavation in wet season. Water courses protected from siltation through use of bunds and sediments ponds.	Minor civil construction works involved, No erosion causing works carried out	

25	Careful construction practices to avoid loss to neighboring properties Productive land to be reinstated after construction Compensation for loss of Production	Incorporated in contract document and implemented through contractor No complaints received regarding loss of neighboring land uses.	
26	Existing borrow sites will be used to source aggregates therefore no need to develop new sources for aggregates.	No borrow site developed for the project. Incorporated in contract document and implemented through contractor.	-
27	Ensure health and safety of Workers	Works are being carried out under best management construction practices. Safety Manuals/safety day celebrations are being in practice by the contractors.	-
28	Training to the DISCOM Environmental monitoring Personnel	Some of the officers attended the trainings and in future regular Participation/organization of the trainings programs will be ensured.	Proper record of training should be maintained and action plan for training the staff and workers will be drawn up and implemented.
29	Effective Environmental monitoring system using checklist	Effective Environmental Monitoring System under the project has been placed. All the contractors have been made responsible to strictly implement the EMP along with the project and Contractor"s designated Environmental/safety Officer will be responsible for monthly reporting and monitoring of EMP implementation to PIU. Similarly all the circle SEs(O&M) have been designated/ authorized to work as an Environmental officers under the ADB Projects and the designated officer will be responsible for EMP"s Environmental compliances, Monitoring and Reporting.	Check list based monitoring has been Initiated and maintained by the Contractors and PIUs.
30	Creation of Environmental and Social Cell , headed by Chief Officer of DISCOM for implementation and monitoring of EMP	The Environmental and Social Management Unit (ESMU) has been reconstituted headed by the Project Director (ADB) and Environmental Specialist with five other technical members The constitution of ESMU has strengthened the monitoring activities.	-

215. Effective Environmental Monitoring Plan under the project has already been in placed. Implementation of environmental mitigation measures is strictly followed for the sub-projects as per agreed monitoring plan. As the civil construction works under the subproject are very meager, the Environmental pollution warranting monitoring of ambient air quality, surface

water quality and noise level were not experienced. Environmental quality monitoring will be conducted by contractors only at places where public complaint arises. Complaints from the affected person were identified as the performance indicator. No complaints were received so far against the substation location, distribution lines alignment selection and impact due to the construction activities under the project. However ambient air, noise level, surface water & ground quality monitoring was carried out, which has shown test results in table no-4.1, 4.2, 4.4, 4.5 subsequently & also discussed under description of environment in chapter-IV.

216. Based on environmental monitoring results shown in table no 4.1, 4.2, 4.4 & 4.5, residual environmental impacts not observed in subprojects areas of DISCOM-West. However project is going on & almost near to completion stages, DISCOM-west is taking care of EMP through contractors till completion of project & thereafter operational stages also.

217. Public consultations during project implementation and operation stages; detailed assessment of the likely impact have been collected by a questionnaire survey. Additionally, approximately 50 to 60 persons have been consulted by administering a environmental/socioeconomic questionnaire to know about the environment impact and general socioeconomics of the proposed investment program. Public consultations were also carried out in September 2017 to December 2017 with respect to updated scope of work, which has been summarized in table no -7.1of Indore region & table no-7.2 of Ujjain region, including public consultation photographs in Appendix-X & public consultation attendance sheets in Appendix-XI for implementation & operational phases. It has observed most of people were positive, satisfied & supportive towards subproject going on for benefits of local people for power requirements, creation of employment & local area developments.

218. Status of grievances reviewed no complaints about environmental pollution or nuisance caused by the sub-project activities were received so far. Hence the grievance redressed committee constituted had not received any representation from the public or stack holders of the project. Complaint register has been maintained at each local project office for registering the complaints.

219. Based on the due diligence conclusions with respect to the available documents and site visit of subproject areas, it is concluded that Presently completed subprojects of DISCOM-West have not found residual environmental impact due to construction & operation phases.

CHAPTER

11. CONCLUSION AND RECOMMENDATION

220. Aside from best engineering practice and survey approaches in selecting the 33/11 KVA substation, 100 KVA DTR & associated 11 KV distribution lines, site slection criteria checklist/questionnaire was included to minimize environmental impacts. Based on study & evaluvation, following consclusions & recommendation are summarized.

221. All substation sites are proposed in Govt land & barren land only, where avoidance of land acquisition was one of the primary considerations in selecting the sites for the proposed 33/11 kV of 40 nos substation (including 8 nos change location of substation).

222. Project of power distribution improvement system does not fall list of project activities, which require obtaining Envrionmental Clerances from MoEFCC/ MPPCB under the EIA act 2006 & amendments, GOI. Under the SPS 2009, the project is classified as B on environment requiring the preparation of an initial environmental examination (IEE). Following the requirements of SPS 2009, this updated IEE is prepared covering the components of the project on distribution system improvement of DISCOM-West.

223. All the substation sites are not located within or near areas that are declared protected by GoI such as the national parks, protected forest and sanctuaries or the cultural/archeological excavation sites of national importance.

224. Lead free batteries will be used in substations for requirements of project activities. Management of discarded used oil from transformers & batteries in operation phase will be done in environmentally sound manner under the HW (M, H&TBM) Rules 2008 & Batteries (Handling & Management) act 2001.

225. All project components do not affect / damage vegetation, aquatic system. Also project activites are stopped during during cultivation/ harvesting season to avoid any loss of crops. Also proposed project components / activities do not effect to indigenous people & any settelments.

226. No major air, water & soil pollution expected from proposed project activites in construction phase. Minimum manpower required for project construction, hence very less sewage quanity will be generated from construction workers of proposed substation sites & managed from well connected nearby public toilet faciliites to use.

227.Noise pollution from substation will be very normal as observed during site visits of existing substations as well within range of prescribed limit of noise level 75 dB (day time) in operttional phase of substation.

228. No major dug of land will be required for 140 kg PCC pole of distribution lines, as it will require less than 1 Cum only for excavation & foundation. Height of PCC pole will be maintained 8 m, including distances of two ploe in line of applicable Indian standards Codes for power transmission & distribution line network.

229. During updation of IEE report phase, distribution lines routes have not recorded any crossing of river & railway line till on going project. Allingment distribution lines route will be lying along the road to avoid the raod crossing, where it is required height of pole will be maintained 8 mt long.

230. Public and scientific concern over the potential health effects associated with exposure to EMF highvoltage power distribution lines and substations, there is no empirical data demonstrating adverse health effects from exposure to typical EMF levels from power transmissions / distribution lines and equipment EMFs occur in nature but current environmental exposure to man-made sources of EMF has progressively increased due to the overwhelming use of electricity and wireless technologies. A human body is exposed to a complex mix of EMFs at various frequencies during lifetime. However, while the evidence of adverse health risks is weak, it is still sufficient to warrant limited concern.

231. Mitigation measures and monitoring to minimize environmental impacts have been incorporated in the environmental management plan and monitoring plan. Environmental monitoring report will be submitted by DISCOM-West to ADB semi-annually during construction and annually during operation. An environmental consultant will provide technical support to DISCOM-West-PMU in addressing relevant environment issues and in complying the requirements of ADB. To ensure sustainability, a workshop/training on safeguards compliance will be part of capacity building provided by the project.

232. The upgrading and/or augmentation of the total 168 nos existing 33/11 kV substations (89 nos under PPR-41-Lot-I & 79 under PPRr-41-Lot-II) & 100 KVA DTR (1221 nos) will mainly involve additional distribution transformers and capacitor banks. Transformers do not involve polychlorinated biphenyls (PCBs). The updated 33 kV distribution lines for feeder birfucation (632.8 km) and 11 kV & LT distribution lines for DTR (1127 km) distribution lines will follow the road easements and will not incur major disturbance during the installation of poles and stringing of conductors.

233. The subprojects included by the DISCOM- west is not expected to cause significant adverse environmental impacts during construction and operation. Impacts associated with construction phase can be easily mitigated by proper planning and best practices in construction engineering. Appropriate construction standards issued by GoI for the design, installation and maintenance of substations and distribution lines such as IS:5613 (1995) Part II, IS:4091-1967 and IS:3072 (1975) will be complied. Measures and monitoring to minimize environmental impacts have been incorporated in the environmental management plan and monitoring plan.

Appendix – I

Rapid Environmental Assessment (REA) Checklist of Subprojects

Substation & Distribution Lines			
Instructions	(i) The project team completes this checklist to support the environmental classification of a project.		
	(ii) This checklist focuses on environmental issues and concerns.		
	(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures		
Country / Project Title	**Madhya Pradesh Power Distribution System Improvement Project**		
Sector / Division / EA	**DISCOM-West (M.P. Paschim Keshtra Vidyut Vitaran Co. Limited, Indore (MP)**		
Sub Project Background:			
Screening Question	**Yes**	**No**	**Remark**
A. Project Siting			
Is the Project area adjacent to or within any of the following environmentally sensitive areas?		√	All proposed substation & distribution line works are either within exisiting sub-stations or on government wastelands and all are away from environmental sensitive areas.
Cultural heritage site		√	None of the proposed sub- stations and distribution lines are located near to any cultural heritage sites or ASI protected monuments
Protected Area		√	None of the proposed sub- stations and distribution lines are located within or close to or passing through any protected areas.
Wetland		√	None of the proposed sub- stations and distribution lines are located within or close to or passing through any wetlands.
Mangrove		√	None of the proposed sub- stations and distribution lines are located within or close to or passing through any mangrove areas.
Estuarine		√	None of the proposed sub- stations and distribution lines are located within or close to or passing through any estuarine areas
Buffer Region of Protected Areas		√	None of the proposed sub- stations and distribution lines are located within or close to or passing through any buffer Region of protected areas
Special Area for Protecting Biodiversity		√	None of the proposed sub- stations and distribution lines are located within or close to or passing through any special area for protecting biodiversity
B. Potential Environmental Impacts will the Project cause			

Encroachment on historical/cultural areas, dsfiguration of landscape and increased waste generation?		√	None of the proposed sub- stations and distribution lines are located near to any heritage / cultural areas or ASI protected monuments
Encroachment on precious ecosystem (e.g. sensitive or protected areas)?		√	None of the proposed sub- stations and distribution lines are located within or close to or passing through precious ecosystem
Alteration of surface water hydrology of waterways crossed by roads and resulting in increased sediment in streams affected by increased soil erosion at the construction site?		√	No such impacts are envisaged due the proposed sub-projects.
Damage to sensitive coastal/marine habitats by construction of submarine cables?		√	No submarines cables proposed in these works.
Deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?		√	No such impacts due to the proposed subprojects. No chemicals proposed to be used during construction. No labor camps expected to be set- up for these works
I ncreased local air pollution due to rock crushing, cutting and filling?		√	No such impacts are envisaged due the proposed sub-projects since no rock crushing, cutting or filling related works envisaged. The construction material will be obtained from statutorily approved sources
Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?		√	The environmental management plan will provide requisite mitigation measures to address issues related with occupational health and safety during project construction and operation.
Chemical pollution resulting from chemical clearing of vegetation for construction site?		√	Chemical cleaning of vegetation is not envisaged in the proposed works.
Noise and vibration due to blasting and other civil works?		√	No blasting works are proposed. However, increased noise levels and vibrations are expected during implementation and operation, for which adequate mitigation measures will be carried out.
Dislocation or involuntary resettlement of people?		√	No such impacts are envisaged due to the proposed sub-projects.
Disproportionate imp a c t s on the poor, women and children, Indigenous Peoples or other		√	No such impacts are envisaged due the proposed sub-projects.

vulnerable groups?			
Social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?		√	No such impacts are envisaged due to the proposed sub-projects. However, if any such impacts are noticed during implementation, the same will be addressed immediately. The relevant mitigation measures will be included in the environmental management plan.
Hazardous driving conditions where construction interferes with pre-existing roads?		√	No such impacts a r e envisaged due to the proposed sub-projects. However, if any such impacts are noticed during implementation, the same will be addressed immediately. The relevant m i t i g a t i o n measures will be included in the environmental management plan
Creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?		√	No such impacts a r e envisaged due to the proposed sub-projects. However, if any such impacts are noticed during implementation, the same will be addressed immediately. The relevant m i t i g a t i o n measures will beincluded in the environmental management plan
Dislocation and compulsory resettlement of people living in right-of-way of the distribution lines & substations ?		√	All proposed substation works are either within exisiting sub-stations or on government wastelands and all distribution lines are along the existing roads only.
Environmental disturbances associated with the maintenance of lines (e.g. routine control of vegetative height under the lines)?		√	The relevant mitigation measures will be included in the environmentalmanagement plan.
Facilitation of access to protected areas in case corridors traverse protected areas?		√	No such impacts are envisaged due the proposed sub-projects. However, if anysuch impacts are noticed during implementation, the same will be addressed immediately. No works will commence prior to obtaining relevant statutory perrmssions.
Disturbances (e.g. noise and chemical pollutants) if herbicides are used to control vegetative height?		√	No such impacts are envisaged due the proposed sub-projects. However,if any such impacts are noticed during implementation, the same will be addressed immediately. No herbicides are proposed to be used to control vegetative growth.

Large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	No such impacts are envisaged due the proposed sub-projects. However, if any such impacts are noticed during implementation, the same will be addressed immediately. The environment management plan will include relevant mitigation measures
S o c i a l c o n f l i c t s if workers from other regions or countries are hired?		√	No such impacts are envisaged due the proposed sub-projects. The locallabor will be given preference. A very limited number of workers from other regions may be engaged for highly skilled works. However, if any such impacts are noticed during implementation, the same will be addressed immediately
Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?		√	The relevant mitigation measures will be included in environmentalmanagement plan to ensure adequate facilities including health. Related impacts are provided to labor in construction camps and work sites
Risks to community safety associated with maintenance of lines and related facilities?		√	No such impacts are envisaged due the proposed sub-projects. However, if any such impacts are noticed during implementation, the same will be addressed immediately. The environment management plan will include relevant mitigation measures.
Community health hazards due to electromagnetic fields, land subsidence, lowered groundwater table, and salinization?		√	No such impacts are envisaged due the proposed sub-projects. Since the proposed distribution lines are of 33 kV and 11 KV, no electromagnetic field related impacts are envisaged.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		√	No such impacts are envisaged due the proposed sub-projects. However, if any such impacts are noticed during implementation, the same will be addressed immediately. The environment management plan will include relevant mitigation measures.
Community safety risks due to both accidental and natural hazards, especially where the structw;al elements or components of the project (e.g., high voltage wires, and transmission towers and lines) are accessible to members of the affected community or where		√	No such impacts are envisaged due the proposed sub-projects. However, if any such impacts are noticed during implementation, the same will be addressed immediately. The environment management plan will include relevant mitigation measures

their failure could result in injury to the community throughout project construction, operation and decommissioning?			
Climate Change & Disaster Risk			
Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, strom surges, tsunami or volcanic eruptions and climate changes.?		√	These questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.
Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost?		√	
Are there any demographic or socio- economic aspects of the Project area that are already vulnerable (e.g. high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?		√	
Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., increasing traffic or housing in areas that will be more prone to flooding, by encouraging settlement in earthquake Regions)?		√	
The proposed environment category of this sub-project is B in accordance with ADB's Safeguards Policy Statement 2009.			

Appendix - II

List of Acts, Rules and Notifications as Applicable to the Project

1	The Environment Protection Act, 1986 The Environment Protection Rules, 1986	It provides for the protection and improvement of environment and the prevention of hazards to human beings, other living creatures, plants and property	2009	All projects/activities/ that being developed, implemented, established, operational and/or being funded, that would discharge or emit any environmental pollutant should take cognizance of this Act/Rule and ensure compliance to the prescribed emission standards	http://MoEFCC.nic.in/modules/rules-and-regulations/environment-protction/	**Environment**
2	Notification on Special Areas/ Restricted Activities	Notification deals with environmental issues in specific notified Regions/areas in different regions and imposition of restrictions/prohibitions on certain industries or activities		All projects/activities being conceptualized, developed, implemented, operational and/or funded should verify the existence/ proximity of any notified area in and around the project site and is found should take cognizance of the provisions of the applicable Special Area Notification	http://MoEFCC.nic.in/modules/rules-and-regulations/environment-protction/	**Environment**
3	Environmental Impact Assessment Notification, 2006	The Notification imposes restrictions and prohibitions on new projects or activities and also on the expansion or modernization of existing projects or activities based on their potential environmental impacts.	2009	All projects/activities being conceptualized, developed, implemented or funded should take cognizance of the Schedule of Activities requiring Environmental Clearance under this Notification and if applicable, required clearances from MoEFCC / State Environmental Impact Assessment Authority should be taken	http://MoEFCC.nic.in/modules/rules-and-regulations/environment-protction/	**Environment**
4	The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008	It provides for regulation and control of indiscriminate disposal of Hazardous waste; and its sound management to reduce risks to environmental and human health	2010	All activities being implemented, operational and/or funded that deal with generation/ handling/storage/processing of hazardous waste should take cognizance of the provisions/schedules of these Rules and obtain authorization from the prescribed Authority/State Pollution Control Board/ Committee	http://www.MoEFCC.nic.in/legis/hsm.htm	**Environment**
5	The Noise Pollution (Regulation and Control) Rules, 2000	It provides for regulations to control ambient noise levels in public places from sources such as industries/construction works/community events, etc.	2010	All projects/activities/ being constructed, operational and/or funded that deal with sound emitting equipments while operational or during construction should take cognizance of the provisions/standards of these Rules and ensure compliance	http://MoEFCC.nic.in/modules/rules-and-regulations/environment-protction/	**Environment**
6	The ORegion Depleting	It provides for regulatory measures so as to ensure	2000	All activities being implemented, operational and/or funded that involve the use/ processing/	http://MoEFCC.nic.in/modules/rules-and-	**Environment**

	Substances (Regulation & Control) Rules, 2000	progressive phasing out of domestic production and imports of oRegion depleting substances		imports/ exports of ORegion depleting substances should take cognizance and comply with the provisions/schedules of these Rules	regulations/environment-protction/	
7	The Batteries (Management & Handling) Rules, 2001	It provides for regulations towards proper management & handling of Lead Acid Batteries so as to avoid, mitigate, minimize adverse impact on environment and human health	2001	All activities being implemented/ operational and/or funded that involve the manufacture, handling, purchase and use of batteries should take cognizance of the provisions and comply with the provisions of these Rules	http://www.MoEFCC.nic.in/legis/hsm.htm	**Environment**
8	Forest (Conservation) Act, 1980 Forest (Conservation) Rules, 2003	It provides for regulation to help conserve the country's forests. It restricts and regulates the de-reservation of forests or use of forest land for non-forest purposes without the prior approval of Central Government.	2004	All projects/activities being conceptualized, developed, implemented or funded within forest areas or depend on use of forest should take cognizance and comply with the provisions of these rules and obtain required clearances from the Forest Department	http://MoEFCC.nic.in/modules/rules-and-regulations/forest-conservation/	**Environment**
9	Wildlife (Protection) Act, 1972	It provides for regulations to effectively protect the wild life with a view to ensuring the ecological and environmental security of the country.	2010	All projects/activities being conceptualized, developed, implemented and/or funded within wildlife sanctuaries or national parks should take cognizance and comply with the provisions of these rules and obtain required clearances from the National Board for Wildlife /Chief Wildlife Warden	http://MoEFCC.nic.in/modules/rules-and-regulations/wildlife/	**Environment**
10	Wildlife Protection Strategy, 2002	The strategy document suggests measures and actions required for management of wildlife and protected areas.	`	All projects/activities being conceptualized, developed, implemented or funded within 10 km of wildlife sanctuaries or national parks should take note of the measures suggested in this Strategy document	http://envfor.nic.in/divisions/wild.html	**Environment**
11	Wetlands (Conservation & Management) Rules, 2010	To provide for protection and management of wetlands in India and regulate the activities within wetlands	2010	All projects/activities being conceptualized, developed, implemented and/or funded in and around wetlands should take cognizance of the provisions of this Notification and obtain required clearances from Central Wetlands Regulatory Authority/ Designated Local State Agency/ Forest Department	http://MoEFCC.nic.in/modules/public-information/home-archive/	**Environment**
12	Central Ground Water Authority, Notification, 1997	It provides for regulation and control of ground water development and management.	2010	All projects being developed, implemented or funded that are dependent on Ground water as a source of water, should take cognizance of the provisions of this Notification/Guidelines and	http://www.cgwb.gov.in/gw_regulation.html	**Environment**

				require to obtain permission from the Central Ground Water Board/Regional Office/Prescribed Authority		
13	Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	It regulates the employment and conditions of service of building and other construction workers and provides for their safety, health and welfare	1996	All projects/activities being implemented and/or funded where cost of construction is more than Rs. 10 lakhs should take cognizance of the provisions of this Act, register establishments and provide for the construction workers in accordance with this Act	http://labour.nic.in/clc/welcome.html#leg	**Health & Safety**
14	Building and Other Construction Workers Welfare Cess Act, 1996 and Rules, 1998	An Act to provide for the levy and collection of a cess on the cost of construction incurred by employers.	1998	All projects/activities being implemented and/or funded where cost of construction is more than Rs. 10 lakhs should take cognizance and comply with the provisions of this Act and pay cess accordingly		**Health & Safety**
15	Workmen Compensation Act, 1923	It provides for payment of compensation by employers to their employees for injury by accident i.e. personal injury or occupational disease	2009	All projects/activities that are operational and/or funded that employ workmen for activities that are hazardous and have health and safety risks should take cognizance of this Act and ensure due compensation to employees in case of any injury	http://labour.nic.in/ss/Notification.html	**Health & Safety**
16	The Child Labour (Prohibition & Regulation) Act, 1986	It prohibits employment of children in certain specified hazardous occupations and processes and regulates the working conditions in others.	1986	All project/activities that are being implemented, operational and/or funded should refrain from employment of children. In case employed should take cognizance and comply with the provisions of this Act.	http://labour.nic.in/cwl/ChildLabour.htm	**Health & Safety**
17	Indian Electricity Rules, 1956	It provides for regulating the supply, Distribution, generation, and use of electricity which includes precautionary measures to be adopted in construction, installation and maintenance of Distribution, distribution, generation and use of electricity.	2000	All projects/ activities establishments being developed, implemented, operational and/or funded that deal with generation, transformation, Distribution, conversion, distribution or use of energy should take cognizance and comply with the provisions of these Rules and obtain required authorization	http://powermin.nic.in/acts_notification/electricity_act2003/preliminary.htm	**Health & Safety**
18	The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 and Rules,	It recognizes and provides for forests rights and occupation in forest land by forest dwelling Scheduled Tribes and other traditional forest dwellers who are integral to the sustainability of the forest ecosystem.	2007	All projects/activities being conceptualized, developed, implemented, operational and/or funded that are within or in close proximity to forest areas should take cognizance of the provisions of this Act/Rules and verify and provide for the rights of the Tribal population	http://tribal.nic.in/index1.asp?linkid=360&langid=1	**Social**

	2007					
19	Land Acquisition Act, 1894	It provides for facilitation in land acquisition for public purposes in cases where land to acquired has private claims	1985	All projects/activities being conceptualized, developed, implemented and/or funded that deal with public purposes or would lead to developmental benefits, for which land is to be acquired, should take cognizance and comply with the provisions of this Act	http://dolr.nic.in/dolr/actandrule.asp	**Social**
20	National Resettlement and Rehabilitation Policy, 2007	It provides for regulations to ensure a humane, participatory and transparent process of resettlement and rehabilitation due to land acquisition for industrialization, infrastructural facilities and urbanization needs	2007	All projects/activities being conceptualized, developed, implemented and/or funded that deal with involuntary displacement due to land acquisition should take cognizance of this policy and provide for fair compensation to the affected parties	http://dolr.nic.in/dolr/actandrule.asp	**Social**
21	The Biodiversity Act, 2002	In order to help in realizing the objectives of CBD, India has enacted an umbrella legislation called the biological Diversity Act 2002(No.18 of 2003) aimed at conservation of biological resources and associated knowledge as well as facilitating access to them in a sustainable manner and through a just process.	2002	It recognizes the sovereign rights of States to use their own Biological Resources.	http://www.envfor.nic.in/divisions/csurv/nba_act.htm	**Environment**

Appendix - III

India and International Environmental Agreements

India is member of almost all major Multilateral Environmental Agreements (MEAs), under four clusters, namely the following:

i. Nature conservation;
ii. Hazardous material;
iii. Atmospheric emissions; and
iv. Marine environment.

There are over 500 active agreements/MOUs etc. to which India is signatory.

There are 20 major multilateral global MEAs, to which India is a signatory. These are listed below:

i. Nature conservation

- Ramsar Convention on Wetlands
- CITES (Convention on International Trade in Endangered Species of
- Fauna and Flora)
- TRAFFIC (The Wildlife Trade Monitoring Network)
- CMS (Convention on the Conservation of Migratory Species)
- CAWT (Coalition Against Wildlife Trafficking)
- CBD (Convention on Biological Diversity)
- ITTC (International Tropical Timber Organisation)
- UNFF (United Nations Forum on Forests)
- IUCN (International Union for Conservation of Nature and Natural
- Resources)
- GTF (Global Tiger Forum)

ii. Hazardous material

- Cartagena Protocol on Biosafety
- SAICM (Strategic Approach to International Chemicals Management)
- Stockholm Convention on Persistent Organic Pollutants (POPs)
- Basel Convention on the Control of Trans-boundary Movement of
- Hazardous Waste and Their Disposal
- Rotterdam Convention on Prior Informed Consent (PIC) for certain
- Hazardous Chemicals and Pesticides in International Trade

iii. Atmospheric emissions

- UNFCCC (United Nations Framework Convention on Climate Change)
- Kyoto Protocol
- UNCCD (United Nations Convention to Combat Desertification)
- Montreal Protocol (on ORegion Depleting Substances)

iv. Marine environment

- IWC (International Whaling Commission)

Source: MoEFCC, India

Appendix – IV

Detailed Updated Scope of Work of DISCOM-West

ADB-III Loan No. 3066, PPR-41 Lot-I. New Sub Station					
S. No.	**Name of Circle**	**Name of Sub Station**	**Distribution Lines (S/s)**		**Remark**
			33 KV Line Provision (KM)	**11 KV Line Provision (KM)**	
1	Indore City	South Div. Office	1.5	2	Original
2		IG Office Indore	0.5	0.2	Change Location Nipania
3		Amar Tekri North Div	3.5	1	Change Location Sector-E
4		Chhota Bangarda	1	4	Original Location (Admn Circle changed Indore (O&M) to Indore City
Total Indore Circle			**6.5**	**7.2**	
5	Indore O&M	Avlai	5	3	Original
6		Kisanganj	10	3	Original
7		Khalkhala	5	3	Original
Total Indore (O&M)			**20**	**9**	
8	Khandwa	Nawali	2	3	Original
9		Bilankheda	10	2	Original
Total Khandwa			**12**	**5**	
10	Burhanpur	Talawadi	2	5	Original
11		Collector office Town	5	5	Original
Total Burhanpur			**7**	**10**	
12	Khargone	Mohammadpur	6	3	Original
13		Hirapur	12	4	Original
14		Chitawad	1	2	Change Location Nilkanth
15		Durgapur	5	3	Change Location Bhangaon
Total Khargone			**24**	**12**	
16	Barwani	Rakhi Bujurg	8	3	Original
Total Barwani			**8**	**3**	

17	Dhar	Kabarwa	13	5	Original
18		Meghapura	5	6	Change Location Narwali
19		Kawada	12	8	Original
20		Phoolgawadi	4	4	Original
Total Dhar			**34**	**23**	Original
21	Jhabua	Badi Khattaly	11	3	Original
22		Pitol	1	2	Change Location Mohankot
Total Jhabua			**12**	**5**	
Total Indore Region			**123.5**	**75.25**	

ADB-III Loan No. 3066, PPR-41 Lot-II. New Sub Station					
S. No.	**Name of Circle**	**Name of Sub Station**	**Distribution Lines (S/s)**		**Remark**
			33 KV Line Provision (KM)	**11 KV Line Provision (KM)**	
1	Ujjain	Ruee	1	1	Original
2		Banjari	6	3	Original
3		Pingleshwer	10	4	Change Location Sandla
4		Palduna	6	1	Original
Total Ujjain			**23**	**9**	Original
5	Dewas	Thuria (Seti)	4.5	8	Original
6		Gada Gaon Nimasa	2	8	Original
7		Neori Phata	0.3	9	Original
Total Dewas			**6.8**	**25**	
8	Shajapur	Siroliya	5	2	Original
9		Tajpur ukala	2	3	Original
10		Dharola	3	3	Original
Total Shajapur			**10**	**8**	
11	Ratlam	Piplodi	10	4	Original
12		Mamatkheda	0.1	5	Original
Total Ratlam			**10.1**	**9**	
13	Mandsaur	Jamalpura	7	3	Original
14		Kothdabahadur	9	3	Original

15		Garoda	5	2	Original
Total Mandsaur			**21**	**8**	
16	Neemuch	Khankhedi	10	1.5	Original
17		Barkheda	3	1.5	Original
18		Jaliner	6	2	Change Location Achalpura
Total Neemuch			**19**	**5**	
Total Ujjain Region			**89.9**	**64**	

ADB-III Loan No. 3066, PPR-41 Lot-I. Augmentation and Additional						
a	**Circle**	**Name of 33/11 KV Substation**	**Scope of Work**			
			Aug. of PTR from 3.15 MVA to 5 MVA (Nos.)	**Aug. of PTR from 5.00 MVA to 8 MVA (Nos.)**	**Addl 5.00 MVA PTR (Nos.)**	**11 KV line on PCC Pole/H-beam Support using Rabbit conductor (Km)**
1	Indore CC	Vijaynagar		1		0.5
2		MPSRTC/Sheelnath Camp		1		2.5
3		LIG/Transformer at LIG and 01 nos.11 KV Bay and Line at Sector-A		1		0.05
4		Sector-F			1	1
5		Hamilton Rd./ Pagnis paga		1		
6		Rajmohalla / Annapurna		1		
7		Fotikoti		1		
8		Sanchar Nagar		1		
9		Goyal Nagar			1	
10		Tejpur/Tajnagar			1	
11		Satyasai		1		
12		Tokoganj / City Control room		1		
13		Manoramaganj		1		
14		Railway Reservation		1		
Total Indore CC			**0**	**11**	**3**	**4.05**
15	Indore (O&M)	Bhagwaniya	1			
16		Panda / (Hasalpur)	1			
17		Nahar kheda			1	
18		Ruddrakhya			1	4
19		Limbodapar			1	2

20		Boriyaborsi			1	4
21		Nawdapanth			1	4
22		Chhota Betma			1	7
23		Sivni	1			5
24		Alwasa	1			
25		Jamli	1			
26		Kalmer/ Additional 05 MVA work	1			
27		Agra 11 KV Line only / Jalodiya panth Transformer	1			3
Total Indore (O&M)			**7**	**0**	**6**	**29**
28		Dongargaon	1			2.5
29		Sulgaon			1	1.5
31	Khandwa	Zumarlkhali/Khandwa city			1	2
32		Satwada			1	1
33		Rangaon	1			2
Total Khandwa			**2**	**0**	**3**	**9**
34		Nimbola	1			6.5
35		Khamni	1			
36	Burhanpur	Shahpur	1			3.5
37		Gondri	1			3
38		OPH City			1	4
Total Burhanpur			**4**	**0**	**1**	**17**
39		Premnagar			1	
40		Orangpura	1			3
41		Jamli	1			
42		Nandgaon / 11 KV Line extra other than activity			1	
43		Talakpura /11 KV Line extra other than activity			1	
44		Lonara	1			3.5
45		Mogargaon	1			
46	Khargone	Bhagwanpura / 11 KV Line extra other than activity			1	
47		Oon			1	2
48		Bhikangaon /Transformer at Bhikangaon, Line at Chiragpura	1			
49		Anjangaon	1			4
50		Ahirkheda	1			4
51		Nagziri / Transformer at Bamnala, Bay &11 KV line at Nagziri	1			

52		Khodi / Bhanpura	1			
53		Belsar/Mogoan	1			
54		Bagod / Sangvi	1			
55		Ghangla/jaimalpura	1			2
56		Malgaon/barud	1			
57		Bediya	1			
58		Kanapur	1			
59		Badud /Surva	1			2
60		Kasrawad/ Lepa Ttransformer and line at Lepa, Line at kasrawad	1			
61		Sayta	1			
62		Makadkheda/Zirniya	1			
63		Balakwada	1			
64		Maltar	1			5
65		Nimrani	1			
66		Mehatwada	1			
67		Bagod			1	
Total Khargone			**23**	**0**	**5**	**25.5**
66	Barwani	Barwani Ind.	1			
67		Kalyanpura	1			
68		Borlai	1			
69		Surana	1			
70		Talwada Deb	1			
71		Dabad	1			
72		Ghatwa	1			
73		Jamti			1	9
74		Palsood			1	
Total Barwani			**7**	**0**	**2**	**9**
75	Dhar	Gulati	1			
76		Kalwani	1			
77		Mirjapur			1	5
78		Kalibawdi			1	4
79		Bilda			1	5
80		Teesgaon	1			
81		Chhayan	1			
82		Rajod			1	1
83		Talanpur			1	1
84		Bola			1	1
Total Dhar			**4**	**0**	**6**	**17**
85	Jhabua	Walpur/Para	1			
86		Jobat/Dabadi	1			
87		Bhabra/Raipuriya	1			

88		Ambua	1			
Total Jhabua			**4**	**0**	**0**	**0**
Total Indore Region			**51**	**11**	**27**	**111.50**

ADB-III Loan No. 3066, PPR-41 Lot-II. Augmentation and Additional						
S. No.	**Circle**	**Name of 33/11 KV Substation**	**Scope of Work**			
			Aug. of PTR from 3.15 MVA to 5 MVA (Nos.)	**Aug. of PTR from 5.00 MVA to 8 MVA (Nos.)**	**Addl 5.00 MVA PTR (Nos.)**	**11 KV line on PCC Pole/H-beam Support using Rabbit conductor (Km)**
1	Ujjain	Dhablagori			1	2
2		Chintaman/Ratadiya	1			
3		Jaithal	1			
4		Asadi/Nahariya			1	4
5		Khamli	1			
6		Kharpa	1			
7		Sarola	1			
8		Kanasiya	1			
9		Nanded	1			
10		Makdone			1	3.5
11		Runkheda			1	3.5
12		Chandesra			1	
13		Narwar			1	
14		Piploda			1	
15		Raghopipliya			1	0.5
16		Chitarkhedi	1			
17		Indokh	1			
18		Nagziri/Unhel railway st.			1	4
19		Palsoda	1		0	3
20		Kothadi	1		0	3
21		Ghinoda			1	
22		Batlawdi	1			
23		Hatai palki			1	
24		Buranabad	1			5
25		Chirola			1	
26		Narsinghgarh	1			
27		Rupeta	1			4
28		Runija	1			
29		Sijawata			1	

30		Akyalimba			1	3
31		Zarda			1	3
32		Ghonsla	1			
33		Banjari	1			
Total Ujjain			**18**	**0**	**15**	**38.5**
34	Dewas	Tonkkhurd	1			2
35		Kalma	1			3
36		Choubarajagir	1			3
37		Nanukheda / Line Dropped	1			3
38		Kamlapur/Jamuniya	1			5
39		Dokakuui	1			4
40		Bijwad (Khategaon T)	1			4
41		Kantaphod	1			4
42		Pipalkota	1			3
43		Pipliya Sadak/Pokhar	1			3
44		Olamba			1	6
Total Dewas			**10**	**0**	**1**	**40**
45	Shajapur	Moyakheda	1			
46		Piplonkala	1			
47		Dehriya soyat	1			
48		Shyampur			1	
49		Bhayana			1	
50		Dadiyakhedi			1	
51		Bakayan			1	
Total Shajapur			**3**	**0**	**4**	**0**
52	Ratlam	Simlawda / Transformer at simlawda,01 nos 11 KV Bay Shivpur and 01 Nos 11 KV Bay Sunkheda	1			
53		Mundri	1			2
54		Dharad	1			
55		Hatpipliya	1			
56		Asawta /Transformer and Line at Asawata, 01 Nos 11 KV Bay at Badawada	1			6
57		Sailana / Ringnod	1			
58		Kamed	1			

59		Rajapura/ Transformer at Barkedakala and 01 Nos 11 KV Bay at Gulbillod,01 Nos 11 KV Bay at Lasudiya Surajmal	1			
60		Kalukheda	1			
Total Ratlam			**9**	**0**	**0**	**8**
61	Mandsaur	Rishyanand	1			
62		Afjalpur	1			
63		Amalawd	1			
64		Melkheda	1			
65		Garoth	1			
66		Bilod			1	
67		Mundri			1	3
68		Pipliya Visniya			1	
69		Bhaguniya / Nataram			1	
70		Babulda			1	
71		B.Istmurar			1	
72		Khajuri Panth			1	
73		Dhalmoo/ Sandhara			1	
74		Rawti / 01 nos 11 KV Bay+Transfromer Plinth+33 Kv and 11 KV protection VCB at Rawati and 01 nos 11 KV Bay and Transformer at Titrod			1	
75		Dhalpat			1	
Total Mandsaur			**5**	**0**	**10**	**3**
76	Neemuch	Dudhtalai	1			
77		Jaat/Fursiya	1			
78		Rampura	1			
79		Ratangarh	1			
Total Neemuch			**4**	**0**	**0**	**0**
Total Ujjain Region			**49**	**0**	**30**	**89.5**

ADB-III Loan No. 3066, PPR-41 Lot-I. Feeder Bifurcation			
S. No.	**Circle**	**Name of 33 KV Feeder**	**Scope as per Award**
			33 Kv Line using PCC pole/H-Beam (KM)
1	Indore O&M	Hatod	12
2		Beganda	4
3		Kadoda	12
4		Navdapanth	7

5		Tarana	10
6		Industrial	2
7		33KV Chota Betma (Add. Line against balance work)	
Total Indore (O&M)			**47**
8	Khandwa	Chichgohan	13
9		Sirsod/Nihalwadi	10
		Killod/Nihalwadi	16
10		New Chandel	6
11		Jalkuwa	12
12		132 KV Dhulhar to Shirpur 13 km	13
13		Chegaon makhan to Maharshiashram	18
Total Khandwa			**88**
14	Dhar	Tanda	8
15		Hatod	10
16		Singhana	12
17		Jerabad	1
18		Tonki	10
19		Badnawar	15
Total Dhar			**56**
20	Jhabua	Sondwa	25
Total Jhabua			**25**
21	Barwani	Julwaniya	10
Total Barwani			**10**
22	Khargone	**P.F.C. (Dropped Location)**	3
23		Khargone-I	3
24		Goradiya	16
25		Chiragpura	14
26		**Bamnala (Dropped Location)**	1
27		**Dhangaon (Dropped Location)**	15
28		**Pipalgone (Dropped Location)**	7
29		New Maral	4
30		Maheshwar (R)	5
Total Khargone			**68**
Total Indore Cicrcle			**284**
Note: 4 nos 33 KV Fedders have been dropped in Khandwa District			

ADB-III Loan No. 3066, PPR-41 Lot-II. Feeder Bifurcation			
S. No.	**Circle**	**Name of 33 KV Feeder**	**Scope of Work**
			33 Kv Line using PCC pole/H-Beam (KM)
1	Ujjain	Ghinoda	7.5
2		Taal	6
3		**Narwar (Dropped Location)**	9
4		Sundarabad	20
5		Ghonsla	0.3
6		Bichrod	6.5
7		Khedamadda	7
8		Banjari	18.5
9		Zarda	5
10		Rupakhedi	15
11		Kanasiya	8
12		Madawada	5
13		Khachrod-II	6
Total Ujjain			**113.8**
14	Dewas	Maksi	7
15		Bhourasa/Devgarh	15
16		V.G mandi	15
17		Sandalpur	1
18		Kshipra	10
Total Dewas			**48**
19	Shajapur	Susner	32
Total Shajapur			**32**
20	Ratlam	**Dhodhar (Dropped Location)**	7
21		Badawada	10
Total Ratlam			**17**
22	Mandsaur	Narayangarh	35
23		Titrod	24
Total Mandsaur			**59**
24	Neemuch	**Nayagaon (Dropped Location)**	14
25		**Zantla (Dropped Location)**	20

26		**Singoli (Dropped Location)**	20
27		Rampura	5
28		Antrimata	20
Total Neemuch			**79**
Total Ujjain Region			**348.8**
Note: 5 Nos 33 KV Fedders have been dropped in 3 nos in Neemuch, 1 no in Ratlam & 1 no in Ujjain District			

ADB-III Loan No. 3066, PPR-42 Lot-I.				
100 KVA DTR & Associated Distribution Lines of 11 KV & LT on AB Cable				
S. No.	**Name of Circle**	**Scope as per Award**		
		100KVA DTR (No.)	**11KV Line (Km)**	**LT Line (Km)**
1	Indore O&M	124	62	51
2	Khandwa	78	40	32
3	Khargone	86	44	36
4	Barwani	16	8	7
5	Dhar	92	47	38
6	Jhabua	18	9	7
Total		**414**	**210**	**171**
ADB-III Loan No. 3066, PPR-42 Lot-II				
100 KVA DTR & Associated Distribution Lines of 11 KV & LT on AB Cable				
S. No.	**Name of Circle**	**Scope as per Award**		
		100KVA DTR (No.)	**11KV Line (Km)**	**LT Line (Km)**
1	Ujjain	305	156	126
2	Dewas	170	87	70
3	Shajapur	78	40	32
4	Ratlam	137	70	57
5	Mandsaur	94	48	39
6	Neemuch	23	12	9
Total		**807**	**413**	**333**

Appendix - V

Land Allotment Circular of Deptt of Revenue, Govt of MP

कार्यालय अध्यक्ष एवं प्रबन्ध निदेशक
मध्यप्रदेश पश्चिम क्षेत्र विद्युत वितरण कंपनी लिमिटेड, इन्दौर

क्र./प्रशा/01/स्था-3/159/16986 इन्दौर/दिनांक 17 SEP 2010

9674
25/09/10

अधीक्षण अभियंता (इं.हो./च.हो.)
म.प्र.प.क्षे.वि.वि.कं.लि.,
इंदौर/उज्जैन ।

विषय — म.प्र. विद्युत पारेषण कंपनी, म.प्र.विद्युत उत्पादन कंपनी तथा म.प्र. विद्युत वितरण कंपनियों को शासकीय भूमि निःशुल्क अंतरित करने बाबत् ।

संदर्भ — (1) अवर सचिव, म.प्र.शासन, ऊर्जा विभाग भोपाल का पत्र क्र.एफ6-2/2009/तेरह दिनांक 26.08.10

विषयांतर्गत लेख है कि म.प्र.पावर जनरेटिंग कं.लि., ट्रांसमिशन कं.लि. तथा तीनों विद्युत वितरण कंपनियों को उनकी परियोजनाओं के लिए शासकीय भूमि बिना प्रीमियम रूपये 1/- वार्षिक भू-भाटक पर दिये जाने के संबंध में राजस्व विभाग द्वारा जारी किये गये परिपत्र क्र.एफ6-25/2010/सात/नजूल दि. 19.05.10 की छायाप्रति सूचनार्थ एवं तदानुसार कार्यवाही हेतु संलग्न प्रेषित है ।

संलग्न — उपरोक्तानुसार ।

अतिरिक्त सचिव

कार्यालय मुख्य अभियंता (इं.क्षे.),
म.प्र.प.क्षे.वि.वि.कं.लि. इंदौर

पृ.क्रमांक 13686 /मु.अ./इक्षे/कार्य/ इन्दौर दिनांक 27-9-10

प्रतिलिपि :—

अधीक्षण यंत्री (शहर/संचा/संधा वृत्त) मप्रपक्षेविविकंलि. इंदौर/खण्डवा/ खरगोन/ धार/ झाबुआ/बड़वानी/बुरहानपुर— कृपया उपरोक्तानुसार आवश्यक कार्यवाही किया जाना सुनिश्चित करें ।

संलग्न — यथोपरि

अधीक्षण अभियंता,
कार्या.मुख्य अभि.(इं.क्षे.)इंदौर

Appendix - VI

Photographs of Progress of Sub-station

PPR 41 Lot – I & Lot – II (Bharat Electrical Contractors & Manufactures, Sangli)

(Details of Substation 33/11 KVA, ADB Loan No. 3066)

S. No.	Name of SubStation	Visit Date
1	Avlai	18.09.2017
2	Rui	13.09.2017
3	Badikhattali	26.11.2017
4	Bilankheda	14.11.2017
5	Jamalpura	13.11.2017
6	Khalkhala	19.09.2017
7	Khankhedi	20.09.2017
8	Kishanganj	20.09.2017
9	Kotdabahadur	13.11.2017
10	Mohammadpur	19.11.2017
11	Phoolgawadi	23.11.2017
12	Rakhi Bujurg	21.11.2017
13	Tajpur Ukala	08.11.2017

Substation – Avlai, Haslpur (New 33/11 KVA) Indore O & M - Bharat Electrical

Location - Avlai, 33/11KVA Substation

Location - Substation- Avlai, 33/11KVA

Location - Front View of Substation Avlai

Location - Side View of Substation Avlai

Location –Village

Location

Area of near Substation

–Fire Safety arrangement

Location – Panel Room Area

Location – Discussion with Local People

		
Location – Front view of Substation	**Location – Main Transformer**	**Location –Side view of Substation**
		
Location – Leftside view of Substation	**Location – Rightside view of Substation**	**Location -Outside view of Panel Room**
		
Location – Snaps of installed Panels	**Location – Inside view of Panel Room**	**Location – Inauguration details of site**
		
Location – Snap of Handpump	**Location – Earthing Pit 01 Substation**	**Location – Earthing Pit 02 Substation**

Substation – Ruie, Ujjain (New 33/11 KVA) Indore O & M - Bharat Electrical

Substation – Badikhattali (New 33/11 KVA) Indore O & M - Bharat Electrical

Location - Badikhattali, 33/11KVA Substation

Location - Substation- Badikhattali, 33/11KVA

Location - View of Substation Badikhattali

Location - Side View of Substation Badikhattali

Substation – Bilankheda (New 33/11 KVA) Indore O & M - Bharat Electrical

Location - Bilankheda, 33/11KVA Substation

Location - Substation- Bilankheda , 33/11KVA

Location - View of Substation Bilankheda

Location - Side View of Substation Bilankheda

Location – Construction View of Substation Bilankheda

Location – Side View of Substation Bilankheda

Substation – Jamalpura, Mandsaur (New 33/11 KVA) Indore O & M - Bharat

Location - Jamalpura, Mandsaur33/11KVA Substation

Location - Substation- Jamalpura, Mandsaur, 33/11KVA

Substation – Centre Point between Khalkhala (New 33/11 KVA) Indore O & M - Bharat Electrical

Location – Road side view

Location - Front side view

Location – Discussion with Villagers

Location - View of Substation Jamalpura, Mandsaur

Location - Side View of Substation Jamalpura, Mandsaur

Jamalpura, Mandsaur

Jamalpura, Mandsaur

		
Location – Outside panel room area	**Location - Left side view of substation**	**Location - Inside panel room area**
		
Location –Right side view	**Location – Panel room area**	**Location – Fire Safety Arrangement**

	
Khankhedi	**Khankhedi**

Substation – Kishanganj (New 33/11 KVA) Indore O & M - Bharat Electrical

Location - Kishanganj, 33/11KVA Substation

Location - Substation- Kishanganj, 33/11KVA

Location - View of Substation Kishanganj

Location - Side View of Substation Kishanganj

Kishanganj

Kishanganj

Substation – Kothdabhadur (New 33/11 KVA) Indore O & M - Bharat Electrical

Location - Kothdabhadur, 33/11KVA Substation

Location - Substation- Kothdabhadur, 33/11KVA

Location - View of Substation Kothdabhadur

Location - Side View of Substation Kothdabhadur

Kothdabhadur

Kothdabhadur

Substation – Mohammadpur (New 33/11 KVA) Indore O & M - Bharat Electrical	
	
Location - Mohammadpur, 33/11KVA Substation	**Location - Substation- Mohammadpur, 33/11KVA**
	
Location - View of Substation Mohammadpur	**Location - Side View of Substation Mohammadpur**

Substation – Phoolgawadi (New 33/11 KVA) Indore O & M - Bharat Electrical	
	
Location - Phoolgawadi, 33/11KVA Substation	**Location - Substation- Phoolgawadi, 33/11KVA**

	
Location - View of Substation Phoolgawadi	**Location - Side View of Substation Phoolgawadi**
	

Substation – Rakhi Bujurg, Barwani (New 33/11 KVA) Indore O & M - Bharat

	
Location - Rakhi Bujurg, Barwani, 33/11KVA Substation	**Location - Substation- Rakhi Bujurg, Barwani, 33/11KVA**

Rakhi Bujurg, Barwani

Rakhi Bujurg, Barwani

Substation – Tajpur Ukala (New 33/11 KVA) Indore O & M - Bharat Electrical

Location - Tajpur Ukala 33/11KVA Substation

Location - Substation- Tajpur Ukala, 33/11KVA

Location - View of Substation Tajpur Ukala

Location - Side View of Substation Tajpur Ukala

 **Tajpur Ukala**	 **Tajpur Ukala**

Photographs

PPR 42 Lot – I & Lot – II (Shriram Switch Gears Pvt. Ltd, Ratlam)

(Details of DTR 100 KVA, ADB Loan No. 3066)

S. No.	Name of SubStation	Visit Date
1	Gokul Singh & Man Singh	15.09.2017
2	Sodam Singh & Ram Singh	15.09.2017
3	Peer mohd.Patel	15.09.2017

Substation – Gokul Singh, Mansingh, Ghosala- Mahidpur (New DTR) - Shriram Electrical

Location – Front side of DTR

Location – Right side view of DTR

Location – Left side view of DTR

Location – Right side view of DTR

Location – Left side view of DTR

Location – Left side view of DTR

Substation – Sodam Singh, Ram Singh DC Panbihar (New DTR) - Shriram Electrical

Location – Left side of DTR

Location – Front side view of DTR

Location – Left side view of DTR

Location –Opposite view of DTR

Location – Right side view of DTR

Location – Opposite view of DTR

Substation – Peer Mohd. Patel, DC Tejpur- (New DTR) - Shriram Electrical	
 Location – Front side of DTR	 Location – Right side view of DTR
 Location – Left side view of DTR	 Location –Near Marghat Landmark view of DTR
 Location – Front side view of Panel Box DTR	 Location –Front side view of Transformer (DTR)

Under Construction Site Photograps

PPR 41 Lot – I & Lot – II

(Bharat Electrical Contractors & Manufactures, Sangli)

(Details of Substation 33/11 KVA, ADB Loan No. 3066)

S. No.	Name of SubStation	Visit Date
1	Mohankot	26.11.2017
2	Sanwer Road, Sector E	19.09.2017
3	Anchalpura	20.09.2017
4	Bhangaon	19.11.2017
5	Narwali	23.11.2017
6	Neori Phata	06.11.2017

Substation – Mohankot, Jhabua (Changed Location) - Bharat Electrical		
 Location – Left side view	 Location - Site view	 Location – Site view
 Location – Site view	 Location Site view	 Location - Site view
 Location –Right side view	 Location – Site view	 Location – Front View

Substation – Sanwer Road Industrial Area (Sector E) – Changed Location(New 33/11 KVA) Indore O & M - Bharat

Location – Left side view

Location – Road Left side view

Location – Front side view

Location – Side view of substation

Location – Side view of substation

Location - Inside panel room area

Location –Panel Room Area

Location – Inside Panel room area

Location – Discussion with Contractor

Substation – Achlapur (New 33/11 KVA) Indore O & M - Bharat Electrical

Location - Achlapur, 33/11KVA Substation

Location - Substation- Achlapur, 33/11KVA

Location - View of Substation Achlapur

Location - Side View of Substation Achlapur

Achlapur

Achlapur

Substation – Bhangaon (New 33/11 KVA) Indore O & M - Bharat Electrical

Location - Bhangaon, 33/11KVA Substation

Location - Substation- Bhangaon, 33/11KVA

Location - View of Substation Bhangaon

Location - Side View of Substation Bhangaon

Substation – Narwali (New 33/11 KVA) Indore O & M - Bharat Electrical

Location - Narwali, 33/11KVA Substation

Location - Substation- Narwali, 33/11KVA

Location - Narwali, 33/11KVA Substation

Location - Narwali, 33/11KVA Substation

Substation – Neori Phata, Dewas (New 33/11 KVA) Indore O & M - Bharat

Location - Neori Phata, Dewas, 33/11KVA Substation

Location - Substation- Neori Phata, Dewas, 33/11KVA

Location - View of Substation Neori Phata, Dewas

Location - Side View of Substation Neori Phata, Dewas

Appendix - VII

Sub-station Site Analysis Covering Environmental Characteristics & Features

Appendix-VI-Substation Site Analysis.pdf

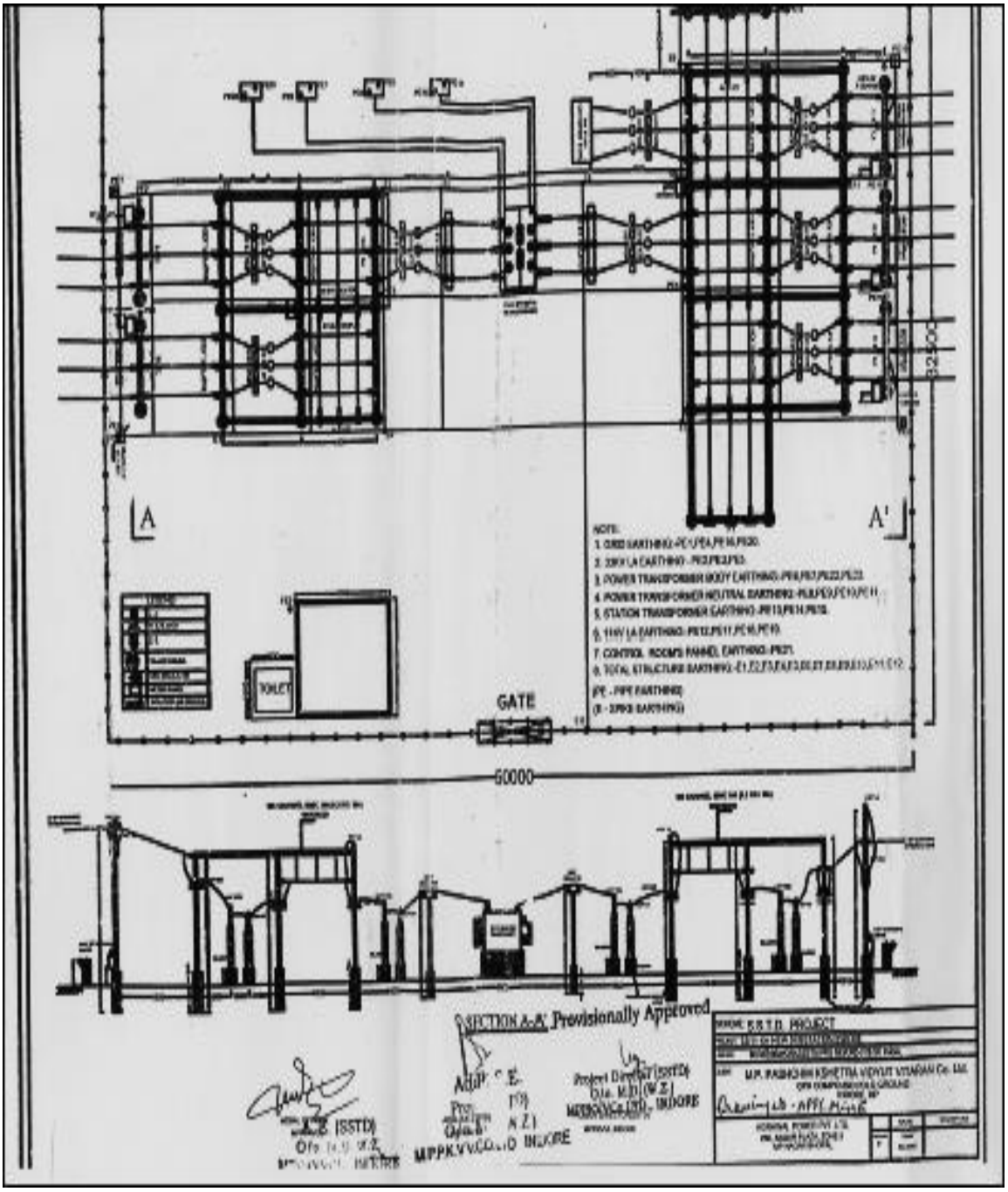
Appendix-VII-Sub-station Site Analysis Covering Environmental Characteristics & Features

GENERAL DETAIL				LAND DETAIL			OWNERSHIP OF LAND	DISTANCE FROM NEAREST				ROAD ACCESSIBILITY	NO. OF FOREST	NO. OF PRIVATE TREE		DISTANCE FROM MOUNTAIN	DISTANCE FROM CULTIVATED LAND	ALTITUDE OF SUB STATION	NEAREST DISTANCE FROM		
S. N.	NAME OF CIRCLE	NAME OF SUBSTATION	CHANGE OF LOCATION	AREA OF LAND (IN HACTARE)	PLAIN/ SLOPE (LAND)	AMOUNT OF LAND CUTTING REQUIRED (APPROXIMATE)	(PRIVATE/ GOVT / FOREST/ OTHER	RIVER NAME & DISTANCE	HIGHWAY	FOREST AREA	VILLAGE/ TOWN			NON FRUIT TREE	FRUIT TREE				AIRPORT	STATE HIGHWAY	NATIONAL HIGHWAY
DETAIL OF SUBSTATION PPR-41,LOT-I																					
1		**SOUTH DIV.OFFICE**	As per Original IEE scope	0.0276	Plain	Nil	Government	Khan River (0.03 Km)	NH-3 (5.5 km)	Nil	Indore	Yes	Nil	Nil	Nil	8.5 KM in SE Mehndipur Balaji Dham	2.8 KM in S Near Vivekanand Square	°30.01"N, 75°52'2	7.2 km in NWW Devi Ahilya Bai Holkar Airport Indore	SH-27, 1.35 Km in SW	NH-3 (5.5 km)
2	**INDORE CITY CIRCLE**	**IG OFFICE INDORE**	Nipaniya Indore	0.1	Slope	Filling Required	Government	Saraswati River (6 Km) in NW Shitala Mata Mandir	NH-3 (0.1 Km)	Nil	Nipaniya, Indore	Yes	Nil	Nil	Nil	11.6 Km in S Mehndipur Balaji Dham	0.35 KM	5'00.2"N, 75°56'0	13.5 km in SWW Devi Ahilya Bai Holkar Airport Indore	SH-27, 8.6 Km in W	NH-3 (0.1 Km)
3		**AMAR TEKRI (NORTH DIV)**	Sector-E (Sanwer Industrial Area)	0.12	Slope	Nil	Government	Saraswati River (1.8 KM) in SE	SH-27 (0.3)	Nil	Bhawrasla, Indore	Yes	Nil	Nil	Nil	10 km in SE	3.5 Km 0.8 km in W	6°37.5"N, 75°50'4	6.9 Km in SW Devi Ahilya Bai Holkar Airport Indore	SH-27 (0.3)	NH-3 (9.5 km)
4		**CHOTA BANGARDA**	As per Original IEE scope	0.1	Slope	Nil	Government	Saraswati River 4.8 km in E	NH-3 12.2 KM in E	Nil	Chhota Bangarda, Indore	Yes	Nil	Nil	Nil	15 Km in SE	0.5 Km	°33.33"N, 75°48'5	SW5 Devi Ahilya Bai Holkar Airport Indore	SH-27, 3.6 Km in W	NH-3 12.2 km
5		**AVLAI**	As per Original IEE scope	0.22	Plain	Nil	Government	Narmada River (150 Km) Choral River 11 km in SE	SH - 27 (50 Km) NH-3 2.25 Km in W	Nil	Awlai, Mhow	Yes	Nil	Nil	Nil	6 Km in S Benchha	0.1 Km	°22.04"N, 75°40'3	25 KM in NE Devi Ahilya Bai Holkar Airport Indore	SH-1, 8.7 Km in W	NH-3 2.25 Km in W
6	**INDORE O&M**	**KISHANGANJ**	As per Original IEE scope	0.39	Plain	Nil	Government	Gambhir River 0.6 Km in SW	SH-01 0.3 Km in W	Nil	Kishanganj, Mhow	Yes	Nil	Nil	Nil	11 Km in SE Bagoda Waterfall	0.5 Km	°40.24"N, 75°46'4	17 KM in N Devi Ahilya Bai Holkar Airport Indore	SH-01 0.3 Km in W	NH-3 3.6 Km in N
7		**KHALKHALA**	As per Original IEE scope	0.146	Plain	Nil	Government	Gambhir River 2.6 Km in W	SH-27 15 Km in E	Nil	Khalkhala	Yes	Nil	Nil	Nil	36 Km in ESE Kedar Kho Hanuman Mandir	0.1 Km	°05.30"N, 75°41'3	27 KM in SE Devi Ahilya Bai Holkar Airport Indore	SH-27 15 Km in E	NH-47 31 Km in S
8		**NAWALI**	As per Original IEE scope	0.165	Plain	Nil	Government	Narmada River 30 KM	SH-27 3.2 km in SW	Nil	Nawali	Yes	Nil	Nil	Nil	120 Km	0.25 KM	°32.45"N, 76°11'4	90 KM in NW Devi Ahilya Bai Holkar Airport Indore	SH-27 3.2 km in SW	NH-3 (60 Km) in NWW
9	**KHANDWA**	**BILANKHEDA**	As per Original IEE scope	0.165	Plain	Nil	Government	Narmada River (60 Km) 30 KM	SH - 27 (6 Km) in NE	Nil	Bilankheda	Yes	Nil	Nil	N/A	111 Km	0.2 Km	9'29.18"N, 76° 9'8	107 KM in NW Devi Ahilya Bai Holkar Airport Indore	SH - 27 (6 Km) in NE	NH-3 (60 Km) in NWW
10		**TALAWADI**	As per Original IEE scope	0.2	Plain	Nil	Government	Narmada River (48 Km) Hathni River 7 km in SW	SH - 26 (10 Km) SH - 38 (10 Km) in NE	Nil	Talawadi	Yes	N/A	N/A	N/A	79 Km 50 km in NW	0.5 Km	°50.07"N, 74°38'4	197 Km 128 Km 107 KM in NW Devi Ahilya Bai Holkar Airport Indore	SH - 38 (10 Km) in NE	NH - 47 (72 Km) NH - 47 (50 Km) in NE
11	**BURHANPUR**	**COLLECTOR OFFICE TOWN**	As per Original IEE scope	0.006	Plain	Nil	Government	Tapi River (4.4 Km) Sapan River 18 km in S	SH-4 (0.25 m) SH-43 21 KM in SE	Nil	Burhanpur	Yes	Nil	Nil	Nil	26 Km 3 KM in W	0.5 Km	21°31'17.51"N, 77°27'48.81"E	191 Km 172 km in SE Nagpur Dr. Babasaheb Ambedkar	SH-43 21 KM in SE	NH - 46 (65 Km) in S
12		**MAHAMMADPUR**	As per Original IEE scope	0.165	plain	Nil	Government	Veda River (2.6 KM)	Khargone Sanawad 3.3 Km in NW	Nil	Mahammadpur	Yes	N/A	N/A	N/A	41 km in SW	0.2 km	°09.90"N, 75°45'5	93 km Indore Airport	Khargone Sanawad 3.3 Km in NW	NH-3 41 km
13		**HIRAPUR**	As per Original IEE scope	0.14	plain	Nil	Government	Khakra River 7.3 km	SH-27 10.5 km in E	Nil	Hirapur	Yes	Nil	Nil	Nil		0.5 km	°10.93"N, 76° 1'2	80 km Indore	SH-27 10.5 km in E	NH-03 60 km
14	**KHARGONE**	**CHITAWAD**	Nilkanth		plain	Nil	Government	Khakra River 1.8 km in N	Khargone Sanawad Road 1.5 km in SE	Nil	Neelkanth	Yes	Nil	Nil	Nil	Dev Garh 29 km in N	0.5 Km	°14.34"N, 75°58'1	67 km Indore	Khargone Sanawad Road 1.5 km in SE	NH-03 52 KM in NW
15		**DURGAPUR**	Bhangaon	0.256	Plain	Nil	Government	Veda River (1.0KM)	Indore - Khargone Highway (25 Km)	Nil	Bhangaon	Yes	Nil	Nil	Nil	137 Km	0.01 Km	25.28"N, 75°57'4	115 Km		NH - 52 (50 Km)
16	**BARWANI**	**RAKHI BUJURG**	As per Original IEE scope	0.506	Plain	Nil	Government	100 mtr Tributary of Gomati River	150 mtr khetia barwani Highway	5 KM	0.2KM	Yes	N/A	N/A	N/A	4.0Km	0.3 km	°10.11"N, 74°31'5	170 km indore	150 mtr khetia barwani Highway	NH-03 58 km
17		**KABARWA**	As per Original IEE scope	0.22	Plain	Nil	Government	20 km	SH - 38 10 KM	0 km	Kabarwa 1 km	Yes 20 km	Nil	Nil	Nil	0 km	3 km	°43.44"N 74°59'3	100 KM	10Km	NH - 47 (55 Km)
18	**DHAR**	**MEGHAPURA**	Narwali	0.15	Plain	Nil	Government	Pond Near 100 mtr	10 km	5 km	100 mtr	2 km	N/A	N/A	N/A	2 km	0.114 mtr	°38.02"N, 74°47'2	0.150 KM	7Km	5Km
19		**Kawda**	As per Original IEE scope	0.105	Slope	Nil	Government	River 10 km	40 km	10 km	5 km	Yes 1 km	N/A	N/A	N/A	1 km	0.05km	°19.01"N, 74°29'4	220 KM	9km	2Km
20		**PHOOLGAWADI**	As per Original IEE scope	0.105	Plain	Nil	Government	Pond Near 1 km	40 mtr	10 km	150 mtr	0.06km	N/A	N/A	N/A	N/A	0.005km	°56.78"N, 75° 0'4	0.140km	5Km	1Km
21	**JHABUA**	**BADIKHATTALI**	As per Original IEE scope	0.1224	Plain	Nil	Government	Hathni River 1.5 km	SH-39 7 km in N	Nil	Badi Khattali	Yes	N/A	N/A	N/A	15 km in S	0.6 km	10.51"N, 74°32'2	136 km Indore	SH-39 7 km in N	NH-47 48 km in N
22		**PITOLNAKA**	Mohankot	0.105	Plain	Nil	Government	Nagari River 4.5 km	SH-39 A 3.4 km in N	Nil	Mohankot	Yes	N/A	N/A	N/A	18 km	0.5 km	°51.79"N, 74°47'5	105 KM indore	SH-39 A 3.4 km in N	NH-47 15.5 km in S

	DETAIL OF SUBSTATION PPR-41,LOT-III																				
23	UJJAIN	RUIE	As per Original IEE scope	0.19	Plain	Nil	Government	Gambira River 3.3 km	SH-17 0.2 km in SW	Nil	Ruie	Yes	N/A	N/A	N/A	N/A	0.2 km	7°5.52"N, 75°39'31	64 km indore	SH-17 0.2 km in SW	NH-03 50 km in E
24		BANJARI	As per Original IEE scope	0.1625	Plain	Nil	Government	Shipra River 3.5 km	SH-17 17 km in SW	Nil	Banjari	Yes	N/A	N/A	N/A	N/A	0.1 km	7°16.42"N, 75°36'1	90 km Indore	SH-17 17 km in SW	NH-03 62 km in SE
25		PINGLESHWAR	Santhola		Plain	Nil	Government	Tributory of Chambal River 4.3 km	SH-17 12.5 km in NE	Nil	Sandla	Yes	N/A	N/A	N/A	N/A	0.5 km	7°58.86"N, 75°23'4	78 km Indore	SH-17 12.5 km in NE	NH-47 73 km in S
26		PALDUNA	As per Original IEE scope	0.3	Plain	Nil	Government	Chambal River 5 km in E	SH-18 4.5 km in NW	Nil	Palduna	Yes	N/A	N/A	N/A	N/A	0.2 km	4°0.99"N, 75°27'47	52 km Indore	SH-18 4.5 km in NW	NH-47 45 km in S
27	DEWAS	THURIA	As per Original IEE scope	0.16	Plain	Nil	Government	Datuni Dam 5 km	SH-41 8 km in E	Nil	0.012KM	Yes	N/A	N/A	N/A	5 km	0.2 km	7°13.07"N, 76°40'4	90 km Indore	SH-41 8 km in E	NH-47 8 km in S
28		GADA GAON NIMASA	As per Original IEE scope	0.175	Plain	Nil	Government	9.5 km datuni River	0.8 km Punasa Sahwas Highway	Nil	Gadaga on	Yes	N/A	N/A	N/A	15 km	0.010KM	7°26.23"N, 76°46'5	Indore	0.8 km Punasa Sahwas Highway	NH-47 22 km in N
29		NEORI PHATA	As per Original IEE scope	0.12	Plain	Nil	Government	22km Tributory of kalisindh River	SH -18 4.5 km in SW	Nil	Neori Phata	Yes	N/A	N/A	N/A	12 km	0.040KM	7°18.72"N, 76° 1'29	Indore	SH-18 (4.5 km) in SW	NH-03 (8 km) in SE
30	SHAJAPUR	SIROLIYA	As per Original IEE scope	0.164	plain	Nil	Government		7 km AB Road	Nil	Sirolya	Yes	N/A	N/A	N/A	N/A	20 mtr	7°2.16"N, 76°12'31	Bhopal Aeport 180 km	12	7
31		TEJPUR UKALA	As per Original IEE scope	0.2375	Plain	Nil	Government	Dudhi Newaj River 8 km	6 km Shajapur-Pachor	Nil	Tagpur Ukala	Yes	N/A	N/A	N/A	N/A	5 mtr	7°23.01"N, 76°45'1	Bhopal Aeport 100 km	10	4
32		DHAROLA	As per Original IEE scope	0.16	Plain	Nil	Government	3.2 KM Tributory of Kalisindh River	SH-14 13km in N	Nil	Dharola	No	N/A	N/A	N/A	2.0Km	0.6Km	2°26.5"N, 76°14'5	136 KM Indore	SH-14 13km in N	NH-03 41 KM in SE
33	RATLAM	PIPLODI	As per Original IEE scope	0.15	Plain	Nil	Government	Maleni River 10 KM in E	SH-31 1 km in E	Nil	Piploda	Yes	N/A	N/A	N/A	35 km in W	0.5 km	0°20.80"N , 75° 06'4	127 km Indore	SH-31 1 km in E	NH 927 A 29 km in SW
34		MAMATKHEDA	As per Original IEE scope	0.16	Plain	Nil	Government	Maleni River 14 KM in E	SH-31 4.5 km in E	Nil	Mamatk heda	Yes	N/A	N/A	N/A	32 km in W	0.5 km	0°48.47"N, 75° 4'43	130 km Indore	SH-31 4.5 km in E	NH 927 A 28 km in SW
35	MANDSAUR	JAMALPURA	As per Original IEE scope	0.16	Plain	Nil	Government	Shivana River 2 Km in S	SH-14 1.2 km in S	Nil	Jamalpu ra	Yes	N/A	N/A	N/A	40 km	0.2 km	7°38.49"N, 74°58'35	170 KM Indore	SH-14 1.2 km in S	NH 56 20 km in W
36		KOTHIDABAHADUR	As per Original IEE scope	0.16	Plain	Nil	Government	Chambal River 5.8 km in NE	SH-14 16.5 km in S	Nil	Kotda bahadur	Yes	N/A	N/A	N/A	N/A	0.3 km	7°41.61"N, 75°22'1	166 KM Indore	SH-14 16.5 km in S	NH 56 63 km in W
37		GARODA	As per Original IEE scope	0.16	Plain	Nil	Government	Chambal River0.0 km in E	SH-31 12.5 km in E	Nil	Garoda	Yes	N/A	N/A	N/A	35 km	0.5	0°45.6"N, 74°58'54	150 KM Indore	SH-31 (12.5 km in E)	NH 56 (28 km in NW)
38	NEEMUCH	KHANKHEDI	As per Original IEE scope	0.16	Plain	Nil	Government	Gandhi Sagar 3.5 Km	Manasa Pipliya Highway 14 km in NW	Nil	Khankhe di	Yes	N/A	N/A	N/A	19 km	0.5	1°08.1"N, 75°16'5	190 KM Indore	Manasa Pipliya Highway 14 km in NW	NH 56 55 km in w
39		BARKHEDA	As per Original IEE scope		Plain	Nil	Government	Gandhi Sagar 12.5 Km	5	Nil	Barkhedi	Yes	N/A	N/A	N/A	N/A	0.4	1°56.60"N , 75°12'3	150	4.2	1.1
40		JALINER	Achalura	0.16	Plain	Nil	Government	3.5	10	Nil	Achalpur a	Yes	N/A	N/A	N/A	N/A	0.4	4°36.28"N, 75° 6'46	350	4.5	1.5

Appendix - VIII

Sub-station Drwaing



Appendix - IX

GRC Formation Circular of DISCOM-West

OFFICE OF THE CMD (WZ)
M.P. PASCHIM KSHETRA VIDYUT VITARAN CO. LTD.,
GPH COMPOUND, POLOGROUND, INDORE (MP)
(EPABX Phone No: 0731-2422045, 2423263, 2422544, 2423577Extn. 151 & 303 Fax No: 2423300)

No: CMD/WZ/04-11/ ADB- /7962 Dated13/04/11

ORDER

In pursuance of the Asian Development Bank (ADB) Guidlines , the Project Grievance Redressal Committee (GRC) is herby constituted in the O/o of the CMD (WZ) MPPKVVCL Indore to receive and facilitate resolution of local communities/ Affected Persons (APs) concerns,complaints and grievances about the Environmental Performance under the ADB projects.

1	Shri D K Gangrade (Addl.CE & Project Director ADB)	Head
2	Shri Gyanesh K Shukla (Environment Specialist)	Member
3	Shri U.K. Ghosh (Superintending Engineer)	Member
4	Shri Sanjay Malviya (Addl. SE(IR)	Member

Project Director (ADB)

Copy to :-

1. The Chief Engineer (IR)/UR M.P.P.K.V.V.C.L INDORE/UJJAIN
2. The Superintending Engineer (O&M) M.P. P.K.V.V.C.L. Indore, Dhar, Jhabua, Khargone, Barwani, Khandwa, Burhanpur, Ujjain, Ratlam, Mandsaur, Neemuch, Dewas, Shajapur, with a instruction that GRC (Grievance Redressal Committee) constituted at each sub project location will ensure the availability of a register for public complaints (if any) at the site offices.
3. Shri Gyanesh K Shukla (Environment Specialist), CMD (WZ), MPPKVVCL, Indore
4. Shri U.K. Ghosh (Superintending Engineer), CMD (WZ), MPPKVVCL, Indore
5. Shri Sanjay Malviya (Addl. SE(IR), CMD (WZ), MPPKVVCL, Indore

Project Director (ADB)

Appendix - X

Photograph of Public Consultation

Appendix - XI

Sample Attendence Sheet of Public Consultation

[illegible]

Attendance Sheet at Public Consultation / Focused Group Discussion (FGD)

Project Site Location [illegible] **Date:** [illegible]

M. P. Paschim Kshetra Vidyut Vitran Company Limited (MPPKVVCL) Indore, 'System Strengthening of Transmission & Distribution' networks			
Sr. No	Name of Person	Designation / Occupation & mobile number	Signature
1	[illegible]	[illegible]	[illegible]
2	Mr [illegible] Khan	Supervisor [illegible]	[illegible]
3	Mr [illegible] Singh	Civil [illegible]	[illegible]
4	[illegible] Singh	Labour - [illegible]	[illegible]
5	Mr [illegible]	Labour - [illegible]	[illegible]
6	Mr [illegible] Khan	[illegible] No number	[illegible]
7	Mr [illegible]	[illegible] No number	[illegible]
8	Mr [illegible]	Site [illegible]	[illegible]
9			
10			

Note: Please attach photograph of group of public consultation group

[illegible]

Change Location

Bhurud

Attendance Sheet at Public Consultation / Focused Group Discussion (FGD)

Project Site Location : Santhala (Ujjain) (Barred Land) **Date:** 15th [illegible]

M. P. Paschim Kshetra Vidyut Vitran Company Limited (MPPKVVCL) Indore, 'System Strengthening of Transmission & Distribution' networks PPP-41 - ADB			
Sr. No	Name of Person	Designation / Occupation & mobile number	Signature
1	Suman Singh	Kisan - Local	[illegible]
2	Shankar Nat	" "	
3	Prakash Bhagi	" "	
4	[illegible]	" "	
5	Mayu Banjara	" "	
6	Chagan Natt	" "	
7	Ankesh Kumar Pandey	[illegible]	[illegible]
8	[illegible]		
9			[illegible]
10	V.K. Sharma AEE.	Nodal officer o/o/E(O&M) Ujjain	[illegible]
11.	B.L. [illegible]	[illegible] EE (O&M) Nagda	[illegible]

Note: Please attach photograph of group of public consultation group

[illegible]

Change Location — Bharat

(Site work not started) — Barren Land

18. Overall progress of work as per scheduled time period- Physical & Financial

19. Any EMP prepared for project execution by contractor

Attendance Sheet at Public Consultation / Focused Group Discussion (FGD)

Project Site Location : [illegible] **Date:** [illegible]

M. P. PaschimKshetraVidyutVitran Company Limited (MPPKVVCL) Indore, 'System Strengthening of Transmission & Distribution' networks

Sr. No	Name of Person	Designation / Occupation& mobile number	Signature
1	[illegible]	[illegible]	
2	[illegible]	[illegible]	[signature]
3			
4			
5			
6			
7			
8			
9			
10			

Note: Please attach photograph of group of public consultation group

[signature] 13-3-17

(Change Location) Bharat

Attendance Sheet at Public Consultation / Focused Group Discussion (FGD)

Project Site Location : 20-3-17 Anchalpur, Narmada **Date:** 20-3-17

M. P. Paschim Kshetra Vidyut Vitran Company Limited (MPPKVVCL) Indore, 'System Strengthening of Transmission & Distribution' networks

Sr. No	Name of Person	Designation / Occupation & mobile number	Signature
1	Ravi Kumar	Farmer Local	रवि
2	Hari Singh	" "	[illegible]
3	Kapil Yadav	Farmer Local	[illegible]
4			
5			
6			
7			
8			
9			
10			

Note: Please attach photograph of group of public consultation group

[signature] 20-3-17

Appendix - XII

Standrad of Ambient Air Quality & Noise Level

NATIONAL AMBIENT AIR QUALITY STANDARDS

S. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential, Rural and Other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1	Sulphur Dioxide (SO_2), µg/m³	Annual*	50	20	- Improved West and Gaeke -Ultraviolet fluorescence
		24 hours**	80	80	
2	Nitrogen Dioxide (NO_2), µg/m³	Annual*	40	30	- Modified Jacob & Hochheiser (Na-Arsenite) - Chemiluminescence
		24 hours**	80	80	
3	Particulate Matter (size less than 10µm) or PM_{10} µg/m³	Annual*	60	60	- Gravimetric - TOEM - Beta attenuation
		24 hours**	100	100	
4	Particulate Matter (size less than 2.5µm) or $PM_{2.5}$ µg/m³	Annual*	40	40	- Gravimetric - TOEM - Beta attenuation
		24 hours**	60	60	
5	Ozone (O_3) µg/m³	8 hours**	100	100	- UV photometric - Chemiluminescence - Chemical Method
		1 hour**	180	180	
6	Lead (Pb) µg/m³	Annual*	0.50	0.50	- AAS/ICP method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
		24 hours**	1.0	1.0	
7	Carbon Monoxide (CO) mg/m³	8 hours**	02	02	- Non Dispersive Infra Red (NDIR) spectroscopy
		1 hour**	04	04	
8	Ammonia (NH_3) µg/m³	Annual*	100	100	-Chemiluminescence -Indophenol blue method
		24 hours**	400	400	

(1)	(2)	(3)	(4)	(5)	(6)
9	Benzene (C_6H_6) µg/m³	Annual*	05	05	- Gas chromatography based continuous analyser - Adsorption and Desorption followed by GC analysis
10	Benzo(a)Pyrene (BaP) - particulate phase only, ng/m³	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/m³	Annual*	06	06	- AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m³	Annual*	20	20	- AAS/ICP method after sampling on EPM 2000 or equivalent filter paper

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note. — Whatever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to initiate regular or continuous monitoring and further investigation.

SCHEDULE

(see rule 3(1) and 4(1))

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 an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is 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.