Environmental Assessment and Review Framework

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IND: Madhya Pradesh Urban Services Improvement Project

Prepared by Project Management Unit, Madhya Pradesh Urban Development Company, Government of Madhya Pradesh for the Asian Development Bank.

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CURRENCY EQUIVALENTS

(as of 7 November 2016)

Currency Unit	–	Indian Rupees (INR)
INR1.00	–	$0.0149
$1.00	=	INR 66.766

ABBREVIATIONS

AC	–	Asbestos Cement
ADB	–	Asian Development Bank
ASI	–	Archeological Survey of India
ASO	–	Assistant Safeguards Officer
C & D	–	Construction & Demolition
CFE	–	Consent for Establishment
CFO	–	Consent for Operation
CPCB	–	Central Pollution Control Board
DC	–	Design Consultants
EAC	–	Expert Appraisal Committee
EC	–	Environmental Clearance
EIA	–	Environmental Impact Assessment
EMF	–	Environmental Management Framework
EMP	–	Environmental Management Plan;
GOI	–	Government of India
GOMP	–	Government of Madhya Pradesh
IEE	–	Initial Environmental Examination
MOEF	–	Ministry of Environment and Forest
MPPCB	–	Madhya Pradesh Pollution Control Board
MPUDC	–	Madhya Pradesh Urban Development Company
MPUSIP	–	Madhya Pradesh Urban Services Improvement Project
NEP	–	National Environment Policy
NOC	–	No Objection Certificate
PHED	–	Public Health Engineering Department
PIU	–	Project Implementation Unit
PMC	–	Project Management Consultant
PMU	–	Project Management Unit
PO	–	Project Officer
PPTA	–	Project Preparatory Technical Assistance
PWD	–	Public Works Department
REA	–	Rapid Environmental Assessment Checklist
SEIAA	–	State Environmental Impact Assessment Authority
SPS	–	Safeguard Policy Statement, 2009
STP	–	Sewage Treatment Plant
UDHD	–	Urban Development and Housing Department
ULB	–	Urban Local Body
WTP	–	Water Treatment Plant

NOTES

(i) The fiscal year (FY) of the Government of India and its agencies ends on 31 March.
(ii) In this report, "$" refers to US dollars.

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I. INTRODUCTION

A. Background

1. Government of Madhya Pradesh with loan funding from Asian Development Bank (ADB) has proposed to implement Madhya Pradesh Urban Services Improvement Project (MPUSIP), herein after referred as 'the Project'. Madhya Pradesh Urban Development Company Limited (MPUDC) shall be the Implementing Agency and the State Urban Development and Housing Department (UDHD) shall be the executing agency for the Project.

2. The Project outputs are as follows:

(i) **Output 1: Improved water supply infrastructure in all project towns and integrated storm water and sewage infrastructure in two towns.** This will include (i) construction of water supply facilities, using DBO model, in all project towns (the facilities will include raw water intakes, water treatment plants, overhead tanks, and distribution networks including the metered household connections); (ii) construction of sewage and storm water management systems in two national heritage tourist towns (Khajuraho and Rajnagar); and (iii) the project implementation capacity strengthening. Based on the geographic location and the size, subprojects in project towns have been grouped into 23 procurement packages to achieve the economies of scale for the contract purposes. Surface water is the source in 60 towns, while groundwater is the source in the remaining four towns. In the four towns dependent on groundwater, the Project will support recharge of groundwater and monitor sustainable use of groundwater.

(ii) **Output 2: Sustained urban infrastructure operation and management in all project towns.** This will include engagement of operators on performance-based, long-term O&M contracts and the monitoring and auditing of the service. After the construction (expected to be completed in 2 years), the contractors of the civil works packages will continue to operate and provide continuous water supply service for project towns for a period of 10 years (storm water drainage and sewage infrastructure in two towns will be managed by the respective ULBs). ADB will partially finance the O&M cost during the project period. MPUDC will pay the contractors the O&M cost on a monthly basis in both fixed fee and performance-linked variable fees according to the contract agreement. The contractor will ensure proper metering and billing, ensure adequate water pressure is maintained, and ensure supplied water complies with national standards for drinking water. The operator will also ensure that the services are responsive and ensure high customer satisfaction. The ULB's obligations include timely setting and adjusting the tariffs, collection of revenue, and managing the defaulters for ensuring cost recovery and fund management for ensuring timely payments to the contractors by MPUDC. After the O&M period of 10 years is completed, the water supply asset will be handed over to the ULBs. The contractor will also train the ULB staff so that adequate capacities are built in the ULBs to operate the transferred assets.

(iii) **tput 3: Improved institutional effectiveness and strengthened capacity in all project towns and Madhya Pradesh Urban Development Company Limited.** This will include (i) setting up of geographic information system (GIS)-based

asset management and service delivery monitoring system; (ii) develop information technology systems in 15 ULB to assist them in the day-to-day management; (iii) improvement of septage management in project towns through implementation of sanitation safety plans; (iv) capacity building of MPUDC and the project towns on managing the DBO contracts, and building up own operation capacity for managing the assets after the contract completion; and (v) conduct awareness-raising activities on water conservation, environmental protection, and hygiene in project towns.

3. The key outcome envisaged from the project is "effective urban water service delivery model rolled out in selective urban clusters of the State with the objective of achieving the following performance indicators by the year 2022.

(i) Access to piped water supply coverage increased to 95% of the households from 33% in 2015 in 64 towns;
(ii) Women's drudgery for fetching water reduced by 80% (from spending an average of 55 minutes in 2015 to 10 minutes);
(iii) Coverage of households with access to improved sanitation systems increased to 80% from 30% in 2015;
(iv) Wastewater collection and/or safe sanitation service coverage increased to at least 80% of the households from 0% in 2015 in two towns;
(v) Incidence of water logging/flooding reduced to two incidents per annum in four towns; and
(vi) Women access to functioning sanitation systems increased to 95% from 25% in 2015 (in poor settlements) in four towns

4. **Implementation Arrangement.** MPUSIP implementation structure is provided in Figure 1. The State's Urban Development and Housing Department (UDHD) is executing agency and the Madhya Pradesh Urban Development Company (MPUDC) is the implementing agency. An Empowered Committee is constituted by the Government for effective and timely implementation. A central Project Management Unit (PMU) attached to MPUDC will be responsible for implementing the MPUSIP. The PMU will be supported by Program Implementation Units (PIUs) with flexibility to redeployment depending upon the implementation requirements.

5. The PMU and PIUs will be supported by several teams of Design Consultants in preparation of preliminary engineering designs. Water Resource Review Committee (WRRC) is constituted to undertake a thorough review of the source when recommended by the Design Consultant in regard to techno-economic feasibility and sustainability especially ensuring climate change resilience, and Technical Review Committee (TRC) to review and approve the preliminary designs developed by the Design Consultants. Project Management Consultant (PMC) centrally located in PMU and with field teams located in PIUs shall be responsible for implementation of the Program. All infrastructure contracts will be procured through performance-based contracts (PBCs) and are likely to include build-operate (BO) framework. Two Committees - an Empowered and Executive Committee and a Technical Clearance and Tender Committee have been constituted by the Government to be responsible for effective and timely implementation of the Program.

Figure 1: MPUSIP Implementation Arrangement

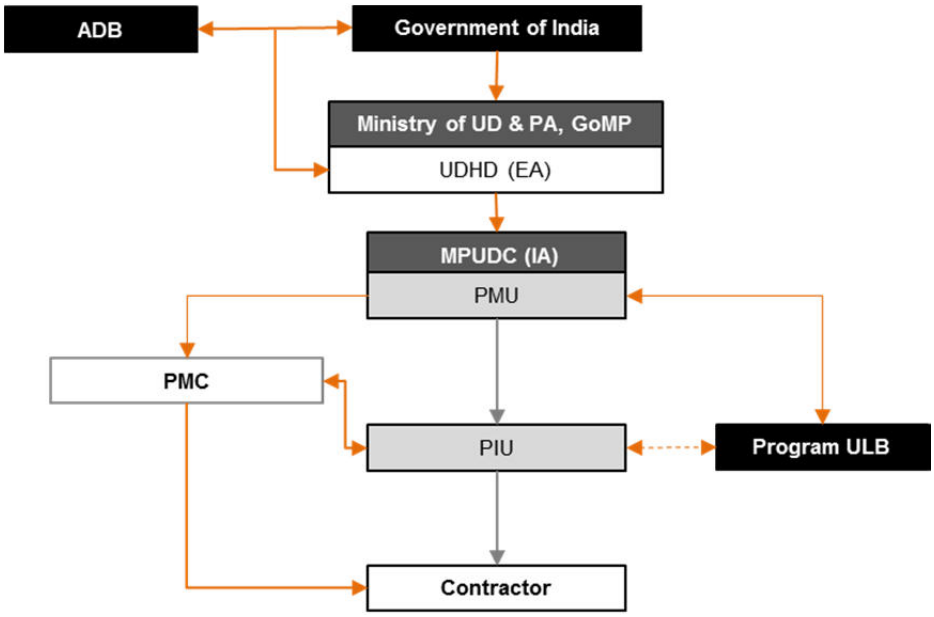


Figure 2: Project Area

B. Purpose of the EARF

6. The EARF is a guiding document during implementation. The EARF (i) describes the proposed subprojects; (ii) explains the general anticipated environmental impacts of the subprojects to be financed under the proposed loan; (iii) specifies the requirements that will be followed in relation to subproject screening and categorization, assessment, and planning, including arrangements for meaningful consultation with affected person and other stakeholders and information disclosure requirements and, where applicable, safeguard criteria that are to be used in selecting subprojects and/or components; (iv) assesses the adequacy of the client's capacity to implement national laws and ADB's requirements and identify needs for capacity building; (v) specifies implementation procedures, including the budget, institutional arrangements, and capacity development requirements; (vi) specifies monitoring and reporting requirements; and (vii) describes the responsibilities of the client and of ADB in relation to the preparation, implementation, and progress review of safeguard documents of subprojects. The subproject selection shall be in accordance with the environmental subproject selection criteria as outlined in this EARF.

7. This EARF is prepared based on (i) ADB's SPS, 2009, and (ii) national and State of Madhya Pradesh environmental acts, rules, regulations, and standards. All environmental assessment is required to follow the procedures outlined in this EARF. Any component included in the project shall comply with Government of India environmental requirements and ADB's SPS, 2009. All environmental documents will be endorsed and approved by MPUDC and cleared by ADB.

8. The EARF ensures that all subprojects under the MPUSIP, throughout the entirety of their project cycle, will not deteriorate or interfere with the environmental sensitivity of a subproject area, but rather improve environmental quality.

II. PROJECT COMPONENTS

9. The project is categorized as category B in accordance with ADB's SPS, 2009. During project preparation, initial environmental examinations (IEEs) were prepared for three number of packages covering water supply subprojects.[1] IEEs concluded that the subprojects will only have small-scale, localized impacts on the environment which are readily mitigated. The potential adverse environmental impacts are mainly related to the construction period, which can be minimized by the mitigating measures and environmentally sound engineering and construction practices. Mitigation measures and monitoring plans were proposed in the environmental management plan (EMP), which forms part of the IEE.

10. Following Table 1 provides the indicative subprojects and physical investment components. List of project towns are provided at Appendix 1.

Table 1: Project Components

Subproject	Main Components	Infrastructure (New or Refurbished)
Water Supply	Source development	Intake works (for surface water sources)
		Tube wells
	Treatment works	Water treatment plant
		Chlorination unit

[1] Kajuraho = Rajnagar Water Supply Subproject, Kothri water supply subproject and Sagar-Makronia Water Supply Subproject.

Subproject	Main Components	Infrastructure (New or Refurbished)
	Water Transmission	Raw Water Transmission mains
		Clear water Transmission mains
	Water Storage	Ground level reservoirs
		Overhead tanks
	Water Distribution	Distribution mains and network
		Bulk valves and flow meters
		House connections
		Household meters
Sewerage and Sanitation	Sanitation	Individual toilets
		Community toilets
	Sewer Network	Sewer network
		Tertiary piped network
		Household connections
	Sewage Transfer	Trunk sewer
	Sewage Treatment Facility	Sewage treatment plant
		Outfall for treated effluent

III. ASSESSMENT OF LEGAL FRAMEWORK & INSTITUTIONAL CAPACITY

A. Country Environmental Safeguard Policies

11. **The Constitution of India** guarantees protection and preservation of environment. The Constitution declares that "it is a fundamental duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures. The Constitution's Directive Principles of State Policy guarantees the environment protection – "the state shall endeavor to protect and improve the environment and to safeguard the forests and wild life of the country".

12. **National Environment Policy, 2006**. India's National Environmental Policy 2006 seeks to extend the coverage, and fill in gaps building on the earlier policies such as National Forest Policy 1988, National Conservation Strategy and Policy Statement on Environment and Development 1992, and Policy Statement on Abatement of Pollution1992. The Objectives of the National Environment Policy 2006 are:

(i) Conservation of critical environmental resources
(ii) Intra-generational Equity: Livelihood Security for the Poor
(iii) Inter-generational Equity
(iv) Integration of Environmental Concerns in Economic and Social Development:
(v) Efficiency in Environmental Resource Use
(vi) Environmental Governance
(vii) Enhancement of Resources for Environmental Conservation

13. **Environment (Protection) Act, 1986, amended 1991**. This Act is promulgated as umbrella legislation for the protection of environment in the country, and seeks to address the gaps in earlier legislations relating to environment. This Act also empowers the government to make rules for protection, conservation and management of environment. The Central government may put restrictions on an area in which any activity/industry, operation or process or class of industries or operations shall not be carried out. If they are to be carried out, they may be permitted with certain safeguards. The Central government may notify emission and effluent standards; the state governments (in case of Madhya Pradesh, the MP Pollution Control Board, MPPCB) can notify more stringent standards for their states, but can't be relaxed.

14. **Water (Prevention and Control of Pollution) Act, 1974, amended 1988.** This act was enacted to prevent and control of water pollution and restore the water quality, through various measurement, important of which is establishment Pollution Control Boards. Following are some important provisions of the Act.

(i) No persons shall knowingly cause or permit any poisonous, noxious or polluting matter determined in accordance with such standards as may be laid down by the SPCB to enter (whether directly or indirectly) into any stream or well or sewer or on land

(ii) No person shall knowingly cause or permit to enter into any stream any other matter which may tend, either directly or in combination with similar matters, to impede the proper flow of the water of the stream in a matter leading or likely to lead to a substantial aggravation of pollution due to other causes or of its consequences

(iii) No person shall, without the prior consent of the State Pollution Control Board:

- Establish or take any steps to establish any industry, operation or process, or any treatment and disposal system or an extension or addition thereto which is likely to discharge sewage or trade effluent into a stream or well or sewer or on land;
- Setting up of industry or process that generates wastewater requires SPCB's consent to establish as well as the consent to operate after the establishment.
- Bring into use any new or altered outlets for the discharge of sewage
- Begin to make any new discharge of sewage
- Penalties for violation of provisions of the Act

15. **Air (Prevention and Control of Pollution) Act, 1981, amended 1987.** The objective of the Air Act is to prevent, control and reduce air pollution including noise pollution and to establish Population Control Boards to administer the Act. No person shall establish or operate any industrial plant, with air pollution potential, without the consent of the SPCB. The consent would contain conditions relating to specifications of pollution control equipment to be installed. The other Provisions of the Act are similar to those of the Water Act, 1974.

16. **Municipal Solid Waste Management Rules, 2016.** Rules notified in April 2016 superseding the erstwhile Municipal Solid Waste (Management & Handling) Rules, 2000. Rules applicable for management of all solid waste (except hazardous, industrial, e-waste, bio-medical, radioactive waste etc.,) provide duties of waste generators in dealing with waste, its segregation, storing etc., duties of various government agencies, urban local bodies, pollution control boards, manufacturers etc., provides criteria, specifications & standards for setting up waste processing, treatment and landfills; criteria for pollution prevention and monitoring.

17. **Construction and Demolition (C&D) Waste Management Rules, 2016.** These Rules notified in March 2016 apply to waste resulting from construction, remodeling, repair and demolition of any civil structure. Rules define C&D waste as waste comprising of building materials, debris resulting from construction, re-modeling, repair and demolition of any civil structure. Waste generator is responsible for collection, segregation of concrete, soil and others waste and storage of C&D waste generated as notified by the local authority. C&D waste shall not be mixed with other solid waste. If waste generation is more than 20 tons in one day or 300 tons in a month, the rules requires submission of waste management plan to the local authority prior to start of work. Rules also notify duties of service providers (like providers of water supply,

sewerage etc.), often generate C&D waste, and requires preparation of a comprehensive waste management plan within six months from the date of this notification. As per the notification, each state should formulate a policy within 12 months, and a C&D waste processing facility is to be commissioned within 36 months (in cities population of less than 0.5 million) of date of this notification.

18. **Forest Act, 1927 and Forest (Conservation) Act, 1980, amended 1988**. Acts empower the government to declare forest areas (reserved, protected and village forests), and regulation of activities within the forests. Use of forest land for any non-forest purpose and forest land conversion will follow the "Guidelines for Diversion of Forest Lands for Non-Forest Purpose" under Forest (Conservation) Act, 1980. The proposal for conversion and compensatory afforestation should be submitted by project proponent to Forest Department, Government of Madhya Pradesh, which will then forward it to the MoEF for approval. The following guidelines will be adhered to in the process:

(i) An equivalent area of non-forest land will be made available for afforestation
(ii) As far as possible, the non-forest land for compensatory afforestation should be identified contiguous to or in the proximity of a reserved Forest or protected forest. If non-forest lands are not available in the same district other non-forest land may be identified elsewhere in the state.
(iii) Where non-forest lands are not available, compensatory afforestation may be carried out over degraded forest twice in extent to the area being diverted.

19. **Wildlife (Protection) Act, 1972**. Comprehensive act for protection and management wildlife, and empowers the government to declare and administer the activities in the Protected Areas (Wildlife Sanctuaries, National parks, biosphere reserves etc.,), and creation of State Wildlife Boards and National Board of Wildlife. Conversion of forest lands that are part of National Parks/Sanctuaries and Tiger Reserve areas (notified under Indian Wildlife (Protection) Act, 1972) is not permitted. In exceptional case, the State Government requires consent of the National Board for Wildlife and Central Empowered Committee of Supreme Court for obtaining wildlife clearance from MoEF. In Madhya Pradesh State, there are 9 national parks and 25 wildlife sanctuaries (Appendix 2).

1. Environmental Assessment

20. Issued under the EP Act, 1986, the EIA Notification of 2006 (replacing the EIA Notification of 1994), sets out the requirement for Environmental Assessment in India. This states that Environmental Clearance is required for specified activities/projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B depending on the scale of the project and the nature of its impacts.

21. Category 'A' projects require Environmental Clearance from the national Ministry of Environment and Forests (MOEF). The proponent is required to provide preliminary details of the project in the form of a Notification, after which an Expert Appraisal Committee (EAC) of the MOEF prepares comprehensive Terms of Reference (TOR) for the EIA study, which are finalized within 60 days. On completion of the study and review of the report by the EAC, MOEF considers the recommendation of the EAC and provides the Environmental Clearance if appropriate.

22. Category B projects require environmental clearance from the State Environment Impact Assessment Authority (SEIAA). The State level EAC categorizes the project as either B1 (requiring EIA study) or B2 (no EIA study), and prepares TOR for B1 projects within 60 days. On completion of the study and review of the report by the EAC, the SEIAA issues the Environmental Clearance based on the EAC recommendation. The Notification also provides that any project or activity classified as category B will be treated as category A if it is located in whole or in part within 10 km from the boundary of protected areas, notified areas or inter-state or international boundaries.

23. Considering the type, nature and scale of subprojects to be implemented under the proposed project, there is unlikely that any subprojects falls under the ambit of the EIA Notification, 2006. None of the sample subprojects require Environmental Clearance (EC). However, the requirement of EC for each subproject needs to be reviewed at part of the planning and design stage.

2. Other Environmental Legislations

24. The table below (Table 2) presents environmental related Acts, Rules, Policies and Regulations currently in force in India that deal with environmental issues that could apply to infrastructure development. Their applicability to the MPUSIP is also given.

Table 2: Applicable Government of India Environmental Legislations and Specific Requirements for MPUSIP

No	Acts, Rules, and Guidelines	Short Description	Requirements for MPUSIP
1.	National Environment Policy (NEP), 2006	• A comprehensive policy document in India for all environmental conservation programs and legislations by Central, State and Local Government. • The dominant theme of this policy is to promote betterment of livelihoods without compromising or degrading the environmental resources. The policy also advocates collaboration method to harness potential resources and strengthen environmental management.	• Project shall adhere to the NEP principle of enhancing and conservation of environmental resources and abatement of pollution
2.	Environmental (Protection) Act, 1986 amended 1991 and the following rules/notifications:	• Serves as an “umbrella” legislation designed to provide a framework for central government coordination for the activities of various established central and state authorities. • As this is an “umbrella” and all-encompassing legislation, this is relevant to MPUSIP activities • There are rules / notifications that have been brought out under this Act, which are directly relevant to MPUSIP (relevant rules and notifications detailed below.	• Compliance with various rules, guidelines and notifications issued under the Act.
3.	Water (Prevention and Control of Pollution) Act, 1974 amended	• Establishes standards for water	• CFE and CFO from MPPCB for

No	Acts, Rules, and Guidelines	Short Description	Requirements for MPUSIP
	1988 and its Rules, 1975	quality and effluents • Also establishes an institutional structure for preventing and reducing water pollution. Consent for establishment (CFE) and consent for operation (CFO) is required when there is impact on water quality.	the construction and operation of sewage treatment plant and water treatment plant • Compliance to conditions and disposal standards stipulated in the CFE and CFO
4.	Air (Prevention and Control of Pollution) Act, 1981, amended 1987 and its Rules, 1982	• Establishes standards for air emissions and ambient air quality • Also establishes an institutional structure for preventing and reducing water pollution. Consent for establishment (CFE) and consent for operation (CFO) is required when there is impact on air quality.	• Applicable for equipment and machineries potential to emit air pollution • CFE and CFO from MPPCB • Compliance to conditions and emissions standards stipulated in the CFE and CFO.
5.	Environment (Protection) Rules, 1986 including amendments	• Establishes standards for emissions or discharge of environmental pollutants • Environmental monitoring and reporting	• STPs should be designed and operated to meet disposal standards • compliance with emission and disposal standards during construction
6.	Municipal Solid Wastes Management Rules, 2016	• Rules to manage municipal solid waste generated; provides rules for segregation, storage, collection, processing and disposal.	• Solid waste generated at proposed facilities shall be managed and disposed in accordance with the MSWM Rules
7	Construction & Demolition Waste Management Rules, 2016	• Rules to manage construction & to waste resulting from construction, remodeling, repair and demolition of any civil structure. Rules define C&D waste as waste comprising of building materials, debris resulting from construction, re-modeling, repair and demolition of any civil structure.	• Construction & demolition waste generated from the project construction shall be managed and disposed as per the rules.
8.	Noise Pollution (Regulation and Control) Rules, 2000	• Ambient air quality standards for noise • Regulate and control noise generating sources • Control measures & restrictions on the use of sound producing instruments	• Compliance with noise standards
9.	Environmental Standards of Central Pollution Control Board (CPCB)	• Environmental standards for discharge of effluents & air emissions from various activities	• Compliance to environmental standards (discharge of effluents)
10.	Notification of Eco Sensitive Zones	• Central government notifies eco sensitive zones Thereby to conserve and protect the natural resources and living beings a notification under the Environmental Protection A	• Restriction of activities (including construction, tree cutting, etc.) in the notified zones • There are no eco sensitive zones in or near the six project towns
11.	Wetland (Conservation and	• Rules framed for the protection	• Prohibits/ regulates activities

No	Acts, Rules, and Guidelines	Short Description	Requirements for MPUSIP
	Management) Rules, 2010	of wetlands and restriction of certain activities in and around wetlands. • Applies to protected wetlands (Ramsar sites, wetlands in eco sensitive areas and UNESCO heritage sites and in high altitudes, and wetlands notified under the rules)	within and near the wetlands • Madhya Pradesh has one Ramsar site – Bhoj Wetland in the state capital Bhopal, which is not a program town
12.	Indian Wildlife (protection) Act, 1972 amended 1993 and Rules 1995 Wildlife (Protection) Amendment Act, 2002	• Provides for the comprehensive protection of Wild animals, birds and plants .This would cover matters concerning Appointment of forest authorities, hunting of wild animals, protection of specified plants, conservation of national parks and sanctuaries, trade commerce in relation to plants and animals and prevention of any offences.	• Applicable to projects located within core or buffer zone of Protected Areas (Wildlife Sanctuaries, National parks, biosphere reserves etc.) • Permission from chief wildlife warden/ State Wildlife Board/ National Board of Wildlife • There are 9 national parks and 25 wildlife sanctuaries in the state
13.	Indian Forest Act, 1927	• Applies to all forests - reserved forests, village forests, and protected forests. In addition to control over forests this act also concerns lands not being the property of government. The Penalties and procedures with regard to all property, cattle trespasses and powers of Forest officers are notified under the Act.	• Declaration of forest areas (reserved, protected and village forests), and regulation of activities within the forests • Applicable to projects located in the forests
14.	Forest (Conservation) Act, 1980 amendment 1988 and the following rules/notifications:	• Provides for conservation of forests • Restricts the dereservation of forests or use of forest lands for non-forest purpose • Non-forest purpose means breaking up or clearing of any forest land	• Restricts use of forest lands for non-forest purposes • Applicable to projects located in forests; requires prior permission to take up the works
	a. Forest (Conservation) Rules, 1981 amended 1992 and 2003	• Rules for conversion / use of forest lands for non-forest purposes	• Applicable to projects located in forest lands; • Prior permission for use of forest land for project proposes from Ministry of Environment, Forest and Climate Change (MoEFCC)
	b. Guidelines for diversion of forest lands for non-forest purpose	• Provides operational guidelines under the above rules for conversion / use of forest lands for non-forest purposes	• Approval of MoEF for any acquisition of forest land • Applicable to projects located in forests • Application for use of forest of land to be made to Forest Department, GoMP • Project proponent to identify non-forest land which is to be transferred to Forest Department for taking up afforestation program • Net Present Value (NPV) of the

No	Acts, Rules, and Guidelines	Short Description	Requirements for MPUSIP
			forest land to be used, cost of afforestation, tree cutting, etc., as determined by Forest Department, is to be paid to the Forest Department
15.	Ancient Monuments and Archaeological Sites and Remains Acts, 1958, its Rules,1959 and notification, 1992 Ancient Monuments and Archeological Sites and Remains (Amendment & Validation) Act, 2010	• Act for better and effective preservation of the archaeological wealth of the country • Provides for the preservation of ancient and historical monuments and archaeological sites and remains of national importance, for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects.	• There are 292 protected monuments including 3 world heritage sites in State of Madhya Pradesh (Appendix 3) • Applicable to projects located in proximity of protected monuments/ sites • No excavation/construction work is allowed within 100 m boundary of protected monuments (prohibited area); works are allowed with prior permission of ASI between 100 to 300 m, (regulated area) • As per the amendment Act, public water supply and sanitation works can be taken up within prohibited and regulated area (i.e. within 300 m of boundary of the monument) but with prior permission from Archaeological Survey of India (ASI)
16.	Contract Labor (Regulation and Abolition) Act, 1970; The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	• Provides for welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law. The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor. • The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc.,	• Applicable to all construction works in the project • Principle employer (MPUDC) to obtain Certificate of Registration from Department of Labour, GoR as principle employer • Contractor to obtain license from designated labor officer • Contractor shall register with Labor Department, GoMP if Inter-state migrant workmen are engaged • Adequate and appropriate amenities and facilities shall be provided to workers including housing, medical aid, traveling expenses from home and back, etc.,
17.	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996	• All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to	• Applicable to any building or other construction work and employ 10 or more workers • Cess should be paid at rate not exceeding 2% of the cost of construction as may be notified

No	Acts, Rules, and Guidelines	Short Description	Requirements for MPUSIP
		pay Cess. The employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures	• The employer is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc. • The employer has to obtain a registration certificate from the Registering Officer
	a. Madhya Pradesh Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Rules, 2002	• Rules established under the Central Act (the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996) • Applicable to all the establishments who carry on any building or other construction work and employ 10 or more workers	• Applicable for all project construction activities • Rules stipulates hours of work, night work, welfare, payment of wages, registers and records, facilities to be provided, and safety & health • To be complied by the contractor during the construction, and registered with the Labor Department
18.	The Child Labour (Prohibition and Regulation) Act, 1986	• Prohibits employment of children below 14 years of age in certain occupations and processes	• Employment of child labor is prohibited in Building and Construction Industry.
19.	Minimum Wages Act, 1948	• Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads and Runways are scheduled employment.	• Applicable to all construction works in the project • All construction workers should be paid not less than the prescribed minimum wage
20.	Workmen Compensation Act, 1923	• Provides for compensation in case of injury by accident arising out of and during the course of employment.	• Compensation for workers in case of injury by accident
21.	Equal Remuneration Act, 1979	• Provides for payment of equal wages for work of equal nature to male and female workers and not for making discrimination against female employees in the matters of transfers, training and promotions etc.	• Equal wages for work of equal nature to male and female workers
22.	Madhya Pradesh Ancient Monuments and Archaeological Sites and Remains Act, 1976	• State-level Act enacted in line with the Central Act (Ancient Monuments and Archaeological Sites & Remains Acts, 1958) • Empowers state government to declare monuments/ sites/antiquities as “protected” and make rules for protection and conservation of protected monuments, areas, antiquities	• An Act to provide for the preservation, protection, upkeep, maintenance, acquisition and regulation of, and control over, ancient and historical monuments, archaeological sites and remains in Madhya Pradesh • Under the Act, state government declares various monuments, sites etc. as protected monument/sites, and called it as ‘protected area’
23.	Madhya Pradesh Ancient Monuments and Archaeological	• Rules for protection and conservation of protected	• Any construction/excavation work in the ‘protected area’

No	Acts, Rules, and Guidelines	Short Description	Requirements for MPUSIP
	Sites and Remains Rules, 1976	monuments, areas, antiquities" • Rules provides for access, and construction and other operations in protected area	requires priori permission of Department of Archeology, irrespective of land ownership of protected area • Application under the Rules, shall be submitted to Director, State Archeological Department, at least 3 months prior to the work • Department provides conditional permission, including time for completion, procedures to be followed during the work and for chance finds etc.
24.	Madhya Pradesh State Environment Policy, 1999	• Guidelines that will facilitate development while ensuring environmental conservation yet without hampering the present and future development imperatives	• Policy seeks to lay guidelines to facilitate development while ensuring environmental conservation • Section 7 is dedicated to Environmental Perspectives in Developmental Activities and deals with agrarian systems, forestry, energy, industry, transportation, mining, and human settlements • Public participation is considered as an important aspect in the policy
25.	Madhya Pradesh Municipal Corporation Act, 1956; and the Municipalities Act, 1961	• Act provides for notification of municipal areas, including the functions and powers	• Prior permission for work along the public thoroughfares from the ULBs and traffic police • Prior permission from the road owner (ULB, PWD, NHAI etc.) for road cutting/ laying of pipes/sewers, etc.,
26.	Madhya Pradesh Prohibition or Regulation of the Cutting of Tress Rules, 2002 MP Regulation of Felling and Removal of Trees in Villages adjoining Government Forests, Rules 2002	• Regulation of tree cutting	• Cutting of trees in non-forest land, irrespective of land ownership, also requires permission from local administration
27.	The ADB Safeguard Policy Statement, 2009 (ADB SPS)	• Policy requires that adverse impacts of projects on environment and people are avoided, and where not possible, should be minimized, mitigated, and/or compensated.	• MPSUIP projects shall comply with SPS policy principles on environment, involuntary resettlement, and indigenous people

B. ADB Environmental Safeguard Policies

25. The ADB Safeguard Policy Statement 2009 (replaces its previous Environmental Policy 2002 and other social safeguard policies) is a comprehensive policy covering environmental, involuntary resettlement and indigenous peoples safeguards. SPS sets out the policy objectives, scope and triggers, and principles for these three key safeguard areas. The objectives of the SPS 2009 are:

(i) avoid adverse impacts of projects on the environment and affected person, where possible;
(ii) minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected person when avoidance is not possible; and
(iii) help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

26. SPS 2009 states that "ADB will not finance projects that do not comply with its safeguard policy statement, nor will it finance projects that do not comply with the host country's social and environmental laws and regulations, including those laws implementing host country obligations under international law". This safeguard policy statement applies to all ADB-financed projects.

27. Objectives of the environmental safeguard requirements are to ensure the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process. Environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts.

28. **Environmental Classification and Environmental Assessment Requirements**. Subprojects[2] are classified into one of the following three categories. Classification is done at early stage of project preparation using the Rapid Environmental Assessment Checklists:

(i) **Category A.** A sub-project is classified as Category A if it could have significant adverse environmental impacts. Such subprojects require Environmental Impact Assessment (EIA);
(ii) **Category B.** A sub-project is classified as Category B if it could have some negative impacts, but these will be less significant than those of category A projects. These subprojects require an Initial Environmental Examination (IEE).
(iii) **Category C.** A sub-project is classified as Category C if it is not expected to have any environmental impacts. In this case no EIA or IEE is required, although environmental implications are still reviewed.

C. Compatibility between Country's & ADB Safeguard Policy

29. The ADB environmental safeguard policy principles are encompassed entirely in its Safeguards Policy Statement 2009. Government of India has a robust environmental legislative framework, embedded in various Acts, Policies, Rules and Regulations. While the ADB SPS is in line with the multilateral development financing institutions, GoI policies are also comparable to international environmental framework including that of ADB. GoI environmental regulatory framework derived from Constitutional Provisions; the National Environmental Policy, 2006 is a comprehensive policy document, addresses all relevant aspects of environmental protection & conservation, environmental sustainability and enforcement. The Environmental (Protection) Act, 1986 and its Rules, Notification, Standards, etc., have created robust regulatory framework. Besides, there are parallel and complementing legislations dealing with specific aspects like forest, wildlife, pollution control, archeological conservation, etc.

[2] Environmental Assessment will be conducted at sub-project level and each subproject will require an IEE and EMP (for category B). MPUSIP will improve infrastructure through the development, design and implementation of a series of subprojects, each providing improvements in a particular sector (water supply or sewerage) in a cluster of towns. Each subproject will be packaged as one civil works contract for construction, and operation & maintenance.

30. The Government of India's environmental assessment and clearance process is, in principle, consistent with ADB's environmental assessment process and public disclosure requirements. Environmental impact assessments (EIAs) for development projects under Category 'A' and 'B1' projects are similar to ADB's screening, categorization, assessment, and clearance/approval systems. The difference between both the requirements is that while the ADB "environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts", the GoI EIA Notification clearly defines the projects/activities and their environmental categories (A/B1/B2) that require environmental assessment. The project/activities included are on the nature, scale and location, and cover activities that are likely to have adverse environmental impacts. The ADB SPS requires the review of environmental assessment requirement for every project separately and assigns classification (A/B/C). Consequently, except the projects with no or very minimal physical construction activities, all the projects will be classified as B or A, and therefore requires environmental assessment.

31. Due to nature and scale, the water supply, sewerage and sanitation subprojects of MPUSIP are not listed in the EIA Notification, 2006 and therefore do not require EIA study or Environmental Clearance. Water Treatment Plant [3] and Sewage Treatment Plant require consent for establishment and consent for operation from Madhya Pradesh Pollution Control Board (MPPCB) under the Water Act, 1974. Besides, if the project is located in forest lands or near protected monuments, it will require approvals as per those regulations.

32. According to ADB SPS, the subprojects are likely to be classified as B due to the nature and scale of projects, and it is unlikely that any project will fall under Category A. As such, no A category projects will be considered for funding under this program. It is therefore require that proposed subprojects are subjected to screening, categorization, and preparation of IEEs and EMPs.

33. The Government of India framework does not prescribe a due diligence or environmental audit to check existing facilities at subproject site(s) to determine whether they could cause, or is causing, environmental risks and impacts. However, ADB's SPS principles require an environmental due diligence or audit even in such circumstances. If the subproject does not foresee any major expansion except refurbishment of existing buildings and facilities, the due diligence or environmental audit constitutes the environmental assessment for the subproject.

34. **ADB SPS Requirements.** During the design, construction, and operation of the project the PMU and PIUs will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

[3] WTPs of capacity more than 1 million liters per day.

Table 3: Applicable WHO Ambient Air Quality Guidelines

Table 1.1.1: WHO Ambient Air Quality Guidelines[7,8]		
	Averaging Period	Guideline value in µg/m³
Sulfur dioxide (SO_2)	24-hour 10 minute	125 (Interim target-1) 50 (Interim target-2) 20 (guideline) 500 (guideline)
Nitrogen dioxide (NO_2)	1-year 1-hour	40 (guideline) 200 (guideline)
Particulate Matter PM_{10}	1-year 24-hour	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline) 150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter $PM_{2.5}$	1-year 24-hour	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline) 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Table 4: World Bank Group's Noise Level Guidelines

Table 1.7.1- Noise Level Guidelines[54]		
	One Hour L_{Aeq} (dBA)	
Receptor	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational[55]	55	45
Industrial; commercial	70	70

Table 5: Comparative Government and ADB Safeguard Requirements

Subproject	Government regulatory Requirement	ADB Requirement	Gap
(1)	(2)	(3)	(4)
All subprojects of water supply, sewerage and sanitation	**EIA Notification, 2006** **Not applicable** (None are listed activities/projects in Schedule I of EIA Notification, 2006. Do not require Environmental Clearance from MoEF. No EIA, public consultation, disclosure required).	**SPS 2009** Classify the project using REA checklist. Categorization (A/B/C). Projects will mostly be classified as B. Category A projects will be excluded from MPUSIP. Preparation of IEE For projects involving facilities and/or business activities that already exist or are under construction, undertake an environment compliance audit. Where non-compliance is identified, a corrective action plan is required. Public consultation in a manner commensurate with the impacts, process and its results are to be documented and reflected in the IEE. Disclosure on ADB's website of the final IEE; updated IEEs and corrective action plans; and environmental monitoring reports. Public disclosure (complete IEE) in an accessible place and local language. Mitigation measures specified in IEE incorporated in project design; incorporate mitigation and monitoring measures (including the EMP) into bid/contract documents. ADB approval of IEE prior to invitation of bids All necessary government approvals/clearances should be in place prior to award of contracts Implementation of EMP; corrective action plans in case of non-compliance Submission of semi-annual monitoring report & disclosure SPS 2009 covers all the aspects of pollution control, archeological and heritage impacts. SPS also requires that all subproject should comply with	MPUSIP projects do not require EIA study as per GoI regulations whereas ADB SPS 2009 requires the process of screening, environmental assessment, public consultation, disclosure, etc., for all projects.
Water supply & sewerage subprojects with treatment plants	**Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments** **Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.** **Applicable to Water Treatment Plant (WTP) component –** requires Consent for Establishment (CFE) and Consent for Operation (CFO) from MPPCB Detailed Project Report to be submitted to MPPCB along with the form (combined form for Air & Water Acts) and prescribed fee. **CFE**. Based on project review and site inspection MPPCB provides CFE before construction, and stipulate the disposal standards to be met during operation. **CFO**. After completion of construction, CFO is issued confirming compliance with the CFE conditions, if any **Renewal of CFO.** Based on the performance of the STP/WTP and its compliance with the disposal standards CFO is renewed every two/three years		As per the ADB all projects must comply with the country environmental regulations to be eligible for funding. Therefore, MPUSIP projects shall comply with all environmental regulations and the consents, clearances, approvals, as required for subproject should be obtained.

Subproject	Government regulatory Requirement	ADB Requirement	Gap
(1)	(2)	(3)	(4)
	Disposal standards are notified under the **Environment (Protection) Act, 1986 and CPCB Environmental Standards. Appendix 4** provides applicable standards.	county safeguard policies During the design, construction, and operation of the project the PMU and PIUs will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.-	
All subprojects.	**Noise Pollution (Regulation and Control) Rules, 2000 amended up to 2010** Rule 3 of the Act specifies ambient air quality standards in respect of noise for different areas/zones. **Appendix 4** provides applicable noise standards. **Construction & Demolition Waste Management Rules, 2016** Rule 4 & 5 specifies the duties of waste generator, and duties of service provider and their contractors. These are to be followed during the construction (**Appendix 5**)		As per the ADB all projects must comply with the country environmental regulations to be eligible for funding. Therefore, MPUSIP projects shall comply with all environmental regulations and the consents, clearances, approvals, as required for subproject should be obtained.
Subprojects located within 300 m of protected monument	**Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010** Works within 300 m boundary of the monument can be done only with prior permission of ASI. Application in prescribed format to be submitted to ASI for permission.		As per the ADB all projects must comply with the country environmental regulations to be eligible for funding. Therefore, MPUSIP projects shall comply with all environmental regulations and the consents, clearances, approvals, as required for subproject should be obtained.
Subprojects located within protected	The Madhya Pradesh Ancient Monuments and Archaeological Sites and Remains Act, 1976	-	As per the ADB all projects must comply with the country environmental regulations to be

Subproject	Government regulatory Requirement	ADB Requirement	Gap
(1)	(2)	(3)	(4)
monument of state government	Any activity within the protected monument requires permission from State Archeological Department		eligible for funding. Therefore, MPUSIP projects shall comply with all environmental regulations and the consents, clearances, approvals, as required for subproject should be obtained.
All subprojects	**Labour laws** Contractor shall register with the state labour department and comply with the provisions, in terms of minimum wages, equal wages for men and women, no child labour, inter-state labour, working conditions, amenities to be provided etc.		As per the ADB all projects must comply with the country environmental regulations to be eligible for funding. Therefore, MPUSIP projects shall comply with all environmental regulations and the consents, clearances, approvals, as required for subproject should be obtained.
Applicable to subprojects located within core or buffer zone of Protected Areas	**Wildlife Protection Act, 1972** It is unlikely that any project located within protected area is included in the project Permission from chief wildlife warden/ State Wildlife Board/ National Board of Wildlife		As per the ADB all projects must comply with the country environmental regulations to be eligible for funding. Therefore, MPUSIP projects shall comply with all environmental regulations and the consents, clearances, approvals, as required for subproject should be obtained.
Subprojects located in forest lands	**Forest (Conservation) Act, 1980 amendment 1988 and the rules/notifications** Prior permission to use forest land for non-forest (project) purposes		As per the ADB all projects must comply with the country environmental regulations to be eligible for funding. Therefore, MPUSIP projects shall comply with all environmental regulations and the consents, clearances, approvals, as required for subproject should be obtained.

D. Institutional Capacity Assessment

35. Government of India has established a very robust institutional structure to enforce environment regulations. The central Ministry of Environment, Forest and Climate Change (MoEFCC) governs and enforces the environmental clearance requirements. Clearances are handled at two levels – clearance to Category A projects is issued at central level by MoEFCC, and for Category B projects, clearance process is decentralized at state-level, and clearance is issued by the respective State-level EIA Authorities set up under the EIA Notification, 2006. MoEFCC has set up 10 regional offices in the country for effective enforcement and to oversee the environmental compliance. Western Zone office is located in Bhopal. Environmental clearance requirements are strictly enforced. Environmental clearance is prerequisite for issuance of any other clearance to start an industry or activity. MoEFCC through its regional offices and state pollution control boards monitor the compliance with the conditions specified in the environmental clearance. Project proponents are required to submit half yearly compliance reports to the regulatory agencies. These reports are lodged on websites for public disclosure.

36. Since none of the MPUSIP projects requires environmental clearance, the projects will not come under the purview of the above enforcement process.

37. **State Level Institutions**. State Pollution Control Boards (MPPCB in Madhya Pradesh) enforce the pollution control laws and regulations (water, air, solid waste etc.). SPCBs enforce the pollution control law through issue of consent for establishment and operation of industries and activities with pollution potential – notified by each SPCB in Red, Orange and Green categories. CFE is issued based on review of project proposal, pollution control measures and visit to proposed site. CFO is issued prior to start of operation. The consent specifies the conditions to be complied with pertaining to emissions, effluents, and solid waste. The consent must be renewed annually or as specified by SPCB. The standards for discharge and other regulations to be followed are established by the Central Pollution Control Board. The SPCBs can further strengthen the standards, but cannot relax. MPPCB has a network of 13 Regional and 4 Sub-regional Offices[4] across Madhya Pradesh state.

38. Only water and sewage treatment plants, which are classified as orange and red category activities respectively, require prior consent of MPPCB. Nevertheless, MPPCB mandate covers overall pollution control and environment protection, and normally acts on all pollution related issues and related public complaints, including on construction activities. However, given limited staff and resources focus is mainly on high polluting industrial activities.

39. During the operation, MPPCB monitors STPs treatment efficiency via review of reports submitted by operation, random visits and sample collection by MPPCB staff and on public complaints.

40. **Forest and Wildlife Institutions.** Robust implementation and enforcement system exists for use of forest lands for non-forest purposes (e.g., for locating project components in forests). The process is cumbersome and time consuming that rightly discourages the location of projects in forestlands unless it is unavoidable. Only MoEFCC has authority to provide forest clearances. The provisions for lands part of protected areas (PAs, National Parks/Sanctuaries etc.,) are even more stringent, requiring approvals from National Board for Wildlife and the Supreme Court. Any activities in eco-sensitive zones (within 10 km of any PA or the notified

[4] Regional offices: Guna, Gwalior, Saga, Jabalpur, Bhopal, Satna, Rewa, Dhar, Indore, Ujjain, Shahdol, Singrauli and Katni. Sub-regional offices: Chindwara, Katni, Waidhan, and Dewas.

width) also regulated strictly, and therefore project activities close to PAs shall be implemented only after consultation with the respective protected area authorities.

41. **Institutional Capacity of Program Agencies**. MPUDC, as the implementing agency, will be responsible for compliance with ADB SPS 2009 and government regulations, which involve conduct of conduct of environmental assessment, preparation and implementation of environmental management plans, monitoring plans, corrective actions plans, where required, public consultation, grievance redress and reporting.

42. Being a newly established agency, MPUDC at present lacks the capacity to handle safeguards. MPUSIP will be the first program to be implemented by MPUDC. The former PMU of Project UDAY is being restructured to function as PMU under MPUDC. Having successfully completed previous projects with due compliance to the country and ADB safeguards systems, PMU is well aware of safeguard policies and procedures. However, the safeguard function at the PMU was operated on as-required basis following the Project UDAY safeguard frameworks. There was no practice of universal application of safeguard policies, as the main purpose of the safeguard function was to comply with the respective funding agency policies, besides compliance with the legal requirements. As soon as Project UDAY was completed, the safeguard function was dismantled and at present there is no safeguard staff in the PMU.

43. Besides, the involvement of government regulatory agencies like MOEFCC and MPPCB, which are mandated with environmental protection and pollution control, and have adequate capacity to handle the safeguards, is limited in MPUSIP.

44. Therefore there is a need to build the institutional capacity at MPUDC in safeguards, which will not only help regulatory and funding agency compliance, but will also enhance the environmental soundness and sustainability of projects.

IV. ANTICIPATED ENVIRONMENTAL IMPACTS

45. MPUSIP will provide / improve water supply and sewerage infrastructure in the selected 128 program towns. Proposed subprojects differ in composition because the towns have different needs, but subprojects in a particular sector generally contain the same basic elements. These are as follows:

(i) **Water supply infrastructure**: source development, treatment facility distribution network improvement, transmission mains, bulk meters, and consumer connections with meters
(ii) **Sewerage & sanitation infrastructure**: individual and community toilets, sewer network, trunk sewers and sewage treatment plant

46. For MPUSIP, an environmental impact is defined as any change to the environment, whether adverse or beneficial; resulting from activities, products or services. It is therefore required that environmental impacts are identified and assessed as part of the planning and design process, and that actions are taken to avoid those impacts, and if cannot be avoided, reduced and mitigated to acceptable levels.

47. While there would be numerous positive benefits in terms of improving quality of life of people as well as raising standards of both individual and public health, MPUSIP projects may also induce certain negative impacts as provision of the water supply and sewerage components will involve physical interaction with the environment. Drawing from the

environmental assessment of sample subprojects in three project towns of Khajuraho, Rajnagar, Kothri, Sagar and Markonia and based on broad range of issues listed in the ADB Rapid Environmental Assessment (REA) checklists that determine project environmental category, Table 6 provides a summary of negative potential environmental impacts which may arise during MPUSIP implementation and general measures to mitigate the impacts. These are indicative impacts, and will need to be further explored during the detailed design. No category A type of works (with significant impacts) are anticipated. Subprojects projected to have potentially significant adverse environmental impacts (categorized as A) will not be considered for implementation under MPUSIP.

48. **Impacts Due to Design and Location.** Almost all of the design impacts can generally be mitigated while there can be significant impacts if the components will be located in environmentally-sensitive areas (in or near wildlife sanctuaries, national parks, forest areas, wetlands, etc.),[5] or in or near physical cultural resources (protected monuments/sites or world heritage sites).[6] MPUSIP will not undertake activities within such sensitive areas and will exclude projects which will cause significant environment impacts[7] such as construction of dams and reservoirs[8].

49. Currently, most of the program towns depend on groundwater. Given the state government policy to reduce dependency on groundwater, MPUSIP will mostly design surface water-based water supply systems. Therefore creation of new infrastructure to extract groundwater will be limited in few towns (approximately 10% of total program towns), which have no feasible surface water source in the proximity. MPUSIP will utilize existing dams/reservoirs to abstract raw water. No new dams/reservoirs will be developed, except small weirs (refer footnote 8).

50. The existing tube wells, overhead tanks, water reservoirs, and offices/structures to be rehabilitated under MPUSIP are all located in government-owned lands. New facilities will be located in government-owned land and pipes will be laid in public right of way to the maximum extent possible to avoid land acquisition.

51. **Impacts Due to Construction**. Except for components of water source and sewage treatment plant development, most impacts will result from considerable construction activities in urban areas. Although construction of MPUSIP components will involve quite simple techniques of civil work, central parts of the 128 towns are characterized as densely populated areas and thoroughfares congested with pedestrians, traffic, and activities thus may result to impacts due to invasive nature of excavation and trenching work for water pipes and sewers. However as most of the individual elements are relatively small and involve straightforward construction, the potential environmental impacts (i) will be mainly localized and not greatly significant; (ii) will not cause direct impact on biodiversity values and (iii) are common impacts of construction in urban areas, and there are well-developed methods for their mitigation.

52. **Impacts Due to Operation and Maintenance (O&M)**. In the operations and

[5] Madhya Pradesh is blessed with rich natural resources with forests cover about 31% of the state. Most of the forest areas are in the southern and eastern parts, and densely forested districts are Balaghat, Mandla, Dindori, Betul, Seoni, Chhindwara, Shahdol, Harda, Sheopur and Sidhi. There are 9 national parks and 25 wildlife sanctuaries in the state (**Appendix 3**).

[6] There are 292 protected monuments including 3 world heritage sites (**Appendix 4**).

[7] Project classified as Category A as per ADB SPS, 2009.

[8] Except small weirs with limited height, confining the water pooling (submergence) to river course, and allowing water to flow freely over the top of weir

maintenance (O&M) period, the infrastructures will operate with routine maintenance, which should not affect the environment. These will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only. Routine repairs and maintenance works will be very small in scale, to conducted manually by small teams of men and works will be very short in duration thus will not cause significant physical impacts.

53. Therefore MPUSIP is unlikely to cause significant adverse impacts and the net environmental benefits to citizens of Madhya Pradesh will be positive. The potential impacts that are associated with design, construction and O&M can be mitigated to standard levels without difficulty through proper engineering design and good high-quality construction and operations and maintenance practices.

Table 6: Potential Environmental Impacts and Risks

Anticipated Impacts	General Mitigation Measures
Design Period	
Loss or damage to environmentally-sensitive areas	• Avoid locating components in or near environmentally-critical areas. If cannot be avoided, refer to protected area management plan • Design surface water intake structures, to minimize impacts on aquatic life. Limit maximum through-screen design intake velocity to limit entrainment of aquatic organisms • If there are threatened, endangered, or other protected species within the hydraulic zone of influence of the surface water intake, ensure reduction of impingement and entrainment of fish and shellfish by the installation of technologies such as barrier nets (seasonal or year-round), screens, and aquatic filter barrier systems
Impairment of physical cultural resources (PCRs)	• Avoid locating components in or near physical cultural resources. If cannot be avoided, consult with ASI (for ASI-protected PCRs) or State Archaeological Department (for state-protected PCRs) • Develop “chance find” procedures that include a pre-approved management and conservation approach for materials that may be discovered
For water supply projects, pollution of source water from upstream anthropogenic activities and soil erosion runoff	• Conduct extensive sanitary survey to avoid locating new water supply sources downstream of pollution sources (sewage and/or drainage outfall, catchment of area of extensive agricultural activities/nutrient runoff, waste dumpsites, pit latrines, toilets, or sewerage treatment plant discharge point)
For water supply projects, impacts due to excessive/unsustainable groundwater extraction (land subsidence, degradation of water quality, etc.)	• Conduct groundwater tests to estimate the sustainable yield • Utilize existing dams/reservoirs as water source subject to technical and economic feasibility • Modify extraction rates and locations as necessary to prevent unacceptable adverse current and future impacts, considering realistic future increases in demand.
For water supply projects, impacts due to excessive/unsustainable surface water withdrawal	• Evaluate potential adverse effects of surface water withdrawal on the downstream ecosystems and use appropriate environmental flow assessment to determine acceptable withdrawal rates.
Impacts due to construction of weir across the rivers and downstream impacts	• Limit the height of the weirs to as much as possible, in no case it shall exceed the height of banks, and the submergence shall be confined to river course only • There shall be no significant reduction in flow nor there shall be any sensitive environmental features in the downstream (like wildlife sanctuaries, national parks etc.), and shall also not have any negative impacts on downstream uses
For water supply projects, risk of pollution of source water due to inadequate protection of intake works or wells	• Develop water source protection plan. It is important to involve the ULB, water regulating authorities, property owners, farmers, industry (if present in the ULB), businesses, community groups, and public health officials. • Locate new facilities at sites where there is low risk of flooding or other hazards that might impair functioning of, or present a risk of damage to water treatment plants, tanks/reservoirs, or their environs.
For water supply projects,	• Follow design criteria in the Ministry of Urban Development (MoUD’s) Central

Anticipated Impacts	General Mitigation Measures
health impacts due to unsatisfactory water supply	Public Health and Environmental Engineering Organization (CPHEEO) Manual on Water Supply and Treatment
For water supply projects, social conflicts from abstraction of raw water for water supply from other water uses of same surface/groundwater sources	• Avoid sources with such conflicts; if unavoidable Water Resource Review Committee to initiate dialogue and resolve issues before investments
For water supply projects, health risks (carcinogenic dusts) due to replacement of asbestos cement pipes[b]	• Avoid any repairs or new connections to/from existing asbestos cement pipes
For sewerage projects, nuisance (noise, smell, and influx of insects, rodents, etc.) to neighboring areas due to location of sewerage facilities	• Avoid locating facilities (sewage treatment plants, sewage sumps and wet wells) near densely populated neighborhoods and installations with potentially sensitive receptors, such as hospitals and schools. . If not possible include buffer zone/greenbelt around the facility • Locate facilities downwind from potential receptors, if possible.
For sewerage projects, impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage	• Avoid locating sewage disposal facilities upstream of water sources. Required distance shall be determined based on the self-cleansing capacity of the receiving water body taking into consideration water flow and effluent quantity. • Follow MoUD's CPHEEO Manual on Sewerage and Sewage Treatment
For sewerage projects, overflows and flooding of neighboring properties with raw sewage	• Locate facilities at sites where there is low risk of flooding or other hazards that might impair functioning of, or present a risk of damage to water treatment plants, tanks/reservoirs, or their environs.
For sewerage projects, inadequate sludge management (handling, treatment and disposal)	• Prepare sludge management plan and ensure its effective implementation
Social conflicts arising from displacement of communities	• Avoid land acquisition to maximum extent possible. For potential involuntary resettlement impacts, prepare a Land and Social Mitigation Plan
Disturbance of services due to shifting of utilities (electric poles, wires, water pipes, etc.)	• Ensure all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosures
Construction Period	•
Noise and vibration from construction activities	• Schedule noisy or otherwise invasive activities during periods of the day which will result in least disturbance • Use of high noise generating equipment shall be stopped during night time. • In unavoidable case of night works (due to local rules) provide prior information to public on work schedule, noisy activities and need to conduct the works at work. Use best construction methods to minimize noise to possible extent. • Vehicle horns should not be used unless it is necessary • All vehicles and equipment to be used in construction shall be fitted with exhaust silencers. • Use silent-type generators (if required) • If it is not practicable to reduce noise levels to or below noise exposure limits, post warning signs in the noise hazard areas. • Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly
Increased dust from construction activities	• Use dust control methods, such as covers, water suppression, or increased moisture content for open materials storage piles • Use of water suppression for control of loose materials on paved or unpaved road surfaces. Ensure unpaved surfaces used for haulage of materials within settlements are dust-free
Increase in vehicle-related pollutants	• Use modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions, and ensure that these are maintained to manufacturers'

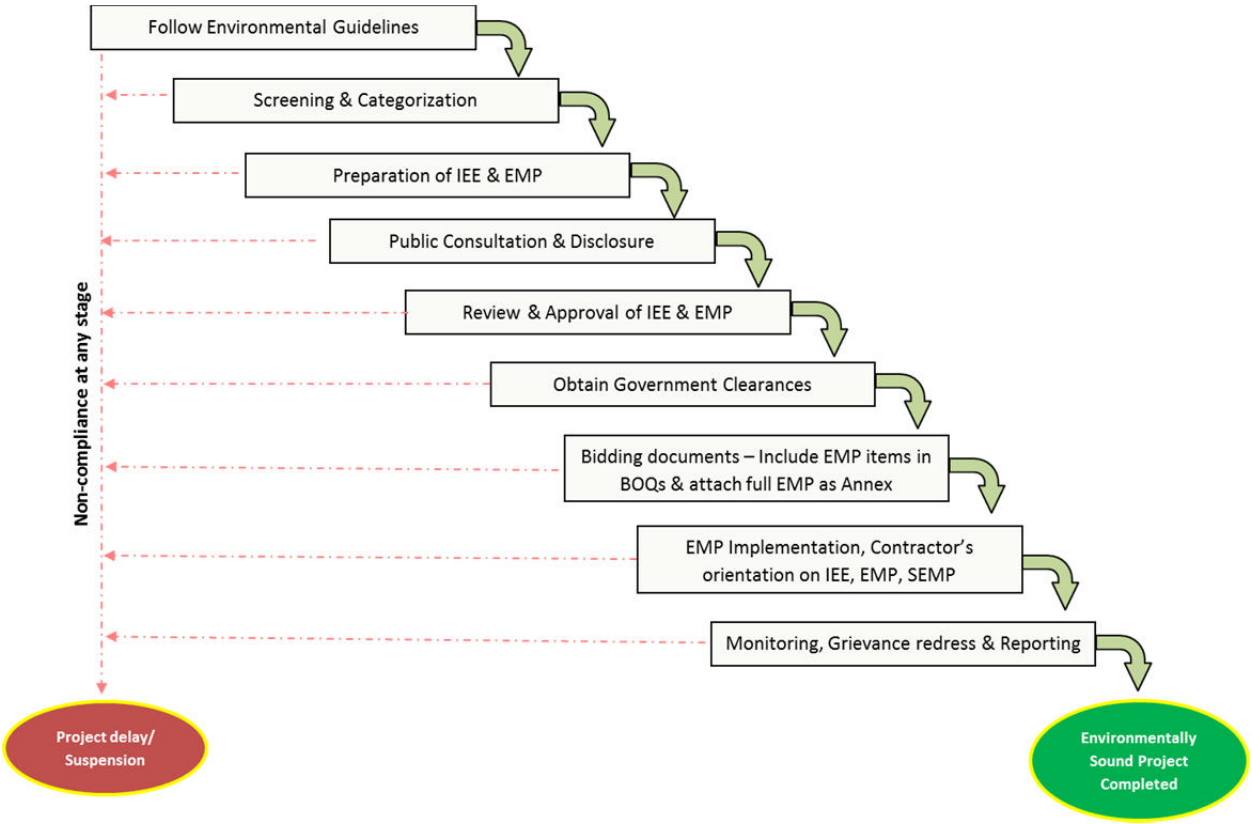
Anticipated Impacts	General Mitigation Measures
	specifications at all times.
Continuing soil erosion/silt runoff in or near construction sites	• Measures to minimize soil erosion/silt runoff to be incorporated when conducting earthworks during monsoon season
Water and land chemical contamination from fuels and lubricants	• Place storage areas for fuels and lubricants away from any drainage leading to water bodies
Water and land contamination from solid and liquid wastes	• Prioritize re-use of excess spoils and materials in construction activities. • Take all precautions to prevent entering of wastes into streams, watercourses, or irrigation systems • Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas
Increased road traffic in the town due to construction activities	• Prepare traffic management plan and ensure sufficient financial provisions for road restoration
Road blocking/closure due to excavation works	• Ensure effective advance communications with the affected residents • Prepare traffic management plan • For affected livelihood, prepare a resettlement plan
Social conflicts between construction workers from other areas and community workers	• Employ labor force from local communities to maximum extent possible • Restrict activities and movement of staff only within designated construction areas.
Safety risks due to deep excavation (workers and public)	• Prepare health and safety plan • Prepare community awareness plan. Consult with local community to inform them of the nature, duration and likely effects of the construction work, and to identify any local concerns so that these can be addressed. • Provide sign boards
For water supply projects, health risks from damaging existing asbestos cement pipe	• Avoid asbestos cement pipes • Prepare asbestos management plan • Stop work immediately to allow further investigation if asbestos cement pipes have been damaged
O&M Period	•
For water supply projects, health impacts due to unsatisfactory raw water supply	• Conduct water quality monitoring at water treatment plant and at strategic points in the distribution system • Ensure standard water quality (Appendix 6) surveillance procedures and protocols as a key obligation of the Contractor with third party checks • Follow MoUD's CPHEEO Manual on Operation and Maintenance of Water Supply Systems
For water supply projects, health and safety hazards to workers from the handling of chlorine and public safety risks from accidental leakage of chlorine gas	• Prevent, minimize, and control potential impacts associated with the storage, handling and use of disinfection chemicals • Minimize the amount of chlorination chemicals stored on site while maintaining a sufficient inventory to cover intermittent disruptions in supply • Ensure that all site personnel have a basic level of H&S training and protective equipment
For water supply projects, safety risks due to pipe repairs (workers and public)	• Provide sign boards and barricades
For sewerage projects, inadequate sludge management (handling, treatment and disposal)	• Treat wastewater and sludge used for land application in a manner consistent with WHO Guidelines for the Safe Use of Wastewater, Excreta and Greywater33 and applicable national requirements
For sewerage projects, health and safety hazards to workers involved in sewerage operation and maintenance due to hazardous working conditions	• Ensure that all site personnel have a basic level of H&S training and availability of H&S protective equipment

[a] Initial assessment of project preparatory technical assistance (PPTA) team indicated presence of asbestos cement pipes in the existing water supply system.

V. ENVIRONMENTAL ASSESSMENT & APPROVAL PROCESS FOR MPUSIP

A. Environmental Safeguard Compliance Process for MPUSIP Projects

54. As presented earlier, all the projects need to go through the process of environmental assessment and obtain approvals / consents, etc., from the government regulatory agencies, to be eligible for funding under the program. The following charts show the process flow to ensure this compliance.



B. Program Environment Category

55. The scope of MPUSIP includes two infrastructure categories: (i) water supply, and (ii) sewerage and sanitation. As part of the program preparation, environmental assessment for sample subprojects in five program towns[9] was conducted and three initial environmental examination reports (IEEs) with environmental management plans (EMPs) were prepared in accordance with requirements of EARF. The IEEs concluded that the project will have only small-scale, localized impacts on the environment which are readily mitigated. The potential adverse environmental impacts are mainly related to the construction period, which can be minimized by the mitigating measures and environmentally sound engineering and construction practices. Therefore, the program has been classified into environmental category B. It is likely that future subprojects will seek to replicate the sample subprojects in other towns and are thus expected to be category B due to the low-impact nature of such works. No category A type of works (with significant impacts) will be considered for implementation in the program.

[9] Khajuraho, Rajnagar, Kothri, Sagar and Makronia.

C. Project Selection Guidelines

1. Exclusion Criteria

56. The following criteria will be used for excluding sites / activities which might have significant negative environmental impacts (**Table 7**). No Category A projects will be considered for implementation under MPUSIP. Subprojects that would directly affect the core or buffer zones of environmental sensitive or protected areas, and highly valued cultural property and fall under Category A shall be strictly avoided or the subproject component(s) causing potential impacts relocated or find suitable alternatives.

Table 7: Exclusion Criteria

S. No	Projects / components to be excluded from MPUSIP
I	*Type of water supply & sewerage projects excluded from MPUSIP*
A	• New water source development - Dams / Reservoirs, except small weirs[a]
II	*Projects that are located in the following eco sensitive areas excluded from MPUSIP*
A	All New projects/components located within: • Wildlife sanctuaries • National parks • Tiger reserves • Elephant reserves
B	Rehabilitation works of existing projects/facilities located in the eco sensitive areas (wildlife sanctuaries, national parks, tiger reserves, elephant reserves etc.,), shall be excluded if the following criteria is not met: (i) Proposed rehabilitation works will be confined to the existing footprint, and within the right of way of existing infrastructure (ii) Proposed rehabilitation works will not require any new clearance/permissions. A written confirmation to that effect from the local office of the respective regulatory agency shall be obtained.
III	*Projects with significant adverse impacts*
C	Projects likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, and may affect an area larger than the sites or facilities subject to physical works (i.e. Category A projects as per ADB SPS 2009) will be excluded from MPUSIP

[a] Height of the weir above the river bed hall be as minimum as possible, and in no case shall exceed the height of river banks, so that the water pooling (submergence) behind the weir is confined to river course. Also, Water will flow over the top of weir freely.

2. Environmental Guidelines for Project Selection

57. The following guidelines (Table 8), to be followed during the identification and finalization of subprojects, provide further guidance to avoid or minimize adverse impacts.

Table 8: Environment Guidelines for Project Selection

	Guidelines
A	**Applicable for all projects**
1	Do not locate projects / components in eco sensitive areas (national parks, wildlife sanctuaries, tiger reserves, elephant reserves)
2	Facilities shall not be sited in locations with social conflicts
3	Avoid locations that will result in destruction/disturbance to historical and cultural places/values
4	Reflect inputs from public consultation for site selection
5	Project / component shall comply with all requirements of relevant national & state laws
6	No project components shall be located within 300 m of ASI protected monuments/sites. In unavoidable circumstances, the works shall be limited to laying of water supply/sewer lines and provision of connections. Permission of ASI must be obtained prior to start of work.
7	Avoid location of projects / components in forest areas

	Guidelines
8	Locate facility such that there is no disturbance/obstruction to natural drainage; no facilities shall be located in lakes, ponds, flood plains etc. Avoid all sites that may pose risk of flooding.
9	Avoid land acquisition and involuntary resettlement by • Using vacant government land where possible • Minimize the land acquisition by all possible measures in design, site or alignment changes etc., • Take all possible measures such as design with minimal land and selection of site or alignment to avoid resettlement impacts, etc.,
B	**Water supply projects**
1	Select sustainable water source – assess water availability and also abstraction should not lead to significant reduction in quantity and quality of overall water source
2	Augmentation of water supply from an existing groundwater source or development of new groundwater source should be supported by groundwater studies establishing water availability and sustainability
3	Do not use water sources that may be polluted by upstream users; ensure adequate distance from upstream disposal point and the project intake (exact distance depend on the flow, disposal source, dilution capacity etc., but in no case an intake should located within 2 km downstream of any disposal point)
4	Avoid water-use conflicts by not abstracting water that is used for other purposes (e.g., irrigation)
5	As far as possible, Locate all new facilities/buildings at sites where there is no risk of flooding
6	As far as possible, locate pumping stations at least 50 m away from any premises used by people (house, shops)
7	As far as possible, locate pipelines within road right of way (RoW) as far as possible, to reduce the acquisition of new land.
8	Ensure sufficient access to water treatment plant, pumping stations, and reservoirs/tanks for operations and maintenance activities.
9	Do not use pipes that are manufactured from asbestos concrete; existing AC pipes, if any, should be left untouched in the ground
10	Ensure efficient water treatment process; avoid wastage of backwash water by recirculation
11	Ensure sludge management facilities are included in the water treatment plant.
C	**Sewerage & sanitation**
1	Provide toilets with water supply and power supply facilities
2	Ensure that toilets developed with proper treatment and disposal systems (on-site facility like septic tank – soak pit or connected to sewerage system)
3	Locate toilets away from dug wells / open wells and shallow tube wells (<50 feet deep)
4	In case of usage of septic tanks, ensure appropriate facilities to collect, treat and dispose septic tank contents
5	Septic tank and soak pit systems should not be developed in high water table areas (water table depth less than 50 feet below ground level)
6	Locate Sewage Treatment Plants (STPS) at least 500m away from inhabited areas
7	As far as possible, locate STPs in areas with least development potential
8	STPs should not be located in areas prone for flooding
9	STPs should be located where there is proper means of treated water disposal/reuse
10	No STP discharge point be located upstream of any water intake (exact distance depend on the flow, disposal source, dilution capacity etc., but in no case, should be located within 2 km upstream of any intake)
11	STP and pumping stations should be located such that there is sufficient access for O & M activities
12	Ensure that treatment process and technology selected is simple and suitable to local conditions; consider availability of resources for O&M (trained manpower, power supply, spare parts, chemicals, etc.,) in facility design
13	As far as possible, minimize the sewer depth by appropriate designs; avoid deep trench excavations in inhabited areas; in unavoidable conditions ensure safety of houses, structures by suitable safety measures

D. Environmental Assessment Process for Subprojects

1. Screening and Categorization

58. As soon as sufficient information on a subproject is available, screening is to be conducted using the ADB's rapid environmental assessment (REA) checklists (Appendix 7) to determine the subproject environmental category. Requirements as per the government

regulations (clearances, approvals, consent etc.,) shall also be identified at this stage, including the requirement for environmental clearance as per the EIA Notification, 2006.

59. Based on the screening, subprojects are to be classified into one of the following categories.

(i) **Category A.** The subproject is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, and may affect an area larger than the sites or facilities subject to physical works. This category of subprojects will not be implemented under MPUSIP.
(ii) **Category B.** The subproject is likely to have less adverse environmental impacts than those classified as Category A. Such impacts are site-specific, mostly reversible, and, in most cases, it is possible to come up with mitigation measures more readily than in Category A projects. An IEE and an EMP are required for Category B projects.
(iii) **Category C.** The subproject is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications of the subproject need to be reviewed.

2. Preparation of Environmental Assessment Report

60. **EIA Study and Report**. Under MPUSIP no Category A projects will be implemented and therefore there is no requirement for conducting detailed Environmental Impact Assessment (EIA) studies and preparation of EIA Reports.

61. **IEE Study and Report**. For B category projects, an Initial Environmental Examination (IEE) report is required. IEE describes the studies conducted to identify the potential environmental impacts of a proposed development, and is prepared when impacts are unlikely to be highly significant and can be mitigated relatively easily. While both the EIA and IEE fulfill the same purpose, EIA is a more detailed study and comprehensive document, because of greater severity of potential impacts.

62. MPUSIP will improve infrastructure through the implementation of a series of subprojects, each providing improvements in water supply or sewerage in a cluster of towns. Thus each subproject, comprising of several towns, will require one IEE Report. MPUSIP covers 128 towns, clubbed into 17 packages for implementation and will require 17 IEE Reports. Besides, each town will have respective detailed project report which will include REA Checklist, town-specific information such as baseline environmental condition, GRM, consultations, etc.

63. Outline and content of an IEE Report is given in Appendix 8. The IEEs prepared during the PPTA for sample subprojects can be used as model documents for future subprojects.

64. Pollution prevention for conservation of resources, particularly technology for management of sewage and sludge, occupational and community health and safety, shall be addressed in the IEEs. During the design, construction, and operation of the project, the executing agency shall apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are

appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS. The IEEs shall also reflect meaningful consultation and disclosure process with a provision for grievance redress mechanism.

65. **Environmental Management Plan**. EMP shall be developed as part of the IEE. The EMP outlines specific mitigation measures, environmental monitoring requirements, and related institutional arrangements, including budget requirements for implementation. Where impacts and risks cannot be avoided or prevented, mitigation measures and actions will be identified so that the subproject is designed, constructed, and operated in compliance with applicable laws and regulations and meets the requirements specified in the EMP. The level of detail and complexity of the EMP and the priority of the identified measures and actions shall be commensurate with the subproject's impacts and risks. Key considerations include mitigation of potential adverse impacts to the level of "no significant harm to third parties," the "polluter pays" principle, the precautionary approach, and adaptive management.

66. If some residual impacts are likely to remain significant after mitigation, the EMP will also include appropriate compensatory measures (offset) that aim to ensure that the project does not cause significant net degradation to the environment. Such measures may relate, for instance, to conservation of habitat and biodiversity, preservation of ambient conditions, and greenhouse gas emissions. Monetary compensation in lieu of offset is acceptable in exceptional circumstances, provided that the compensation is used to provide environmental benefits of the same nature and is commensurate with the project's residual impact.

67. All IEEs shall be conducted and EMPs prepared prior to invitation of the bids for construction contracts. The bid documents shall include the requirement to incorporate necessary resources to implement the EMP. The EMP will form part of the contract document, and, if required, will need to be further updated during the construction phase of a subproject.

68. In case subproject requires EIA study as per the GoI's EIA Notification, the environmental assessment documents prepared shall, to the extent possible, meet both EARF and Government of India requirements in order to streamline the environmental procedures required.

3. Environmental Audit of Existing Facilities

69. For subprojects involving facilities that already exist or are under construction, an environment audit shall be undertaken, including on-site assessment, to identify past or present concerns related to impacts on the environment. The objective of the compliance audit is to determine whether actions were in accordance with the EARF, and to identify and plan appropriate measures to address outstanding compliance issues. Where noncompliance is identified, a corrective action plan will be prepared. The plan will define necessary remedial actions, the budget for such actions, and the time frame for resolution of noncompliance. The audit report (including corrective action plan, if any) will be made available to the public in accordance with the information disclosure requirements of the EARF.

4. Public Consultation, Information Disclosure & Grievance Redress

70. Public consultation and information disclosure is mandatory as part of the environmental assessment process for MPUSIP projects. The adequacy of the public consultation and disclosure during the environmental assessment process will be one of the criteria used to

determine the project compliance with ADB safeguard policies. Similarly, a grievance redress mechanism (GRM) to receive, evaluate, and facilitate the resolution of affected person's concerns, complaints, and grievances about the social and environmental performance at project level is to be established and detailed out in the IEE Report. GMR should be made operation during the EMP implementation phase.

71. The process of public consultation and information disclosure, which is to be carried through the project preparation and implementation, is presented in detailed the following sections E, F & G respectively.

5. Review & Approval of Environmental Assessment Reports

72. IEE including EMPs will be reviewed and approved by Project Officer (Environment) of PMU. Approval of safeguard documents of respective subproject is pre-requisite to initiate the bidding process.

73. Under a sector loan, the borrower or the executing agency is primarily responsible for identifying, prioritizing, formulating, appraising, approving, and implementing subprojects in accordance with technical, financial, and economic appraisal criteria, including social and environmental criteria, mutually agreed upon between ADB and the borrower/executing agency. ADB will be minimally involved in processing subprojects, except that in the initial phase, if deemed necessary, a few subprojects may be appraised by ADB to serve as models. ADB will review the IEEs of first three subprojects of each subsector (feasibility studies, if necessary detailed design too) of each subsector (water supply, sewerage, sanitation, etc.).

74. MPUDC will forward the all EIAs for Category A projects, but this type of project is not foreseen under the MPUSIP. ADB will review draft final reports of: (i) IEEs for the first three subprojects of each subsector (water supply, sewerage, sanitation, etc.); and (ii) EIAs of any new subproject classified as category A.

75. For subproject processing, the steps to be followed are shown in Table 9. It is the responsibility of the executing and implementing agencies to ensure subprojects are consistent with the legal framework, whether national, state, or municipal/local. Compliance is required in all stages of the project, including design, construction, and operation and maintenance. Stricter requirements apply in case the result of ADB's classification is different from that of the government's EIA Notification Act.

Table 9: Environmental Procedures for Project Processing

Project Stage	EARF Procedure	Government of India Procedure
Subproject identification	REA checklist	Categorization according to schedule and general/specific conditions in the government's EIA Notification, 2006 (as amended till date)
	Categorization (A/B/C): PMU to review the REA checklists and reconfirm the categorization	PMU to review the subproject proposals, and classify (A/B1/B2) as per the schedule. As of now None of the subprojects to be proposed under the MPUSIP are currently listed in the Schedule of EIA Notification 2006, and therefor EIS study and EC is not required. Liaise with the SEIAA / MoEF regularly for future policy changes in the EIA Notification

Project Stage	EARF Procedure	Government of India Procedure
		and its applicability to the MPUSIP. Identify other environmental related regulatory requirements based on the nature and location of the subproject (consent from TNPCB, clearance/approvals from ASI, Forest Department etc.,)
Detailed design	Preparation of EIA/IEE Updating of sample IEEs based on detailed design	Submit application in the prescribed format to SEIAA for Category B and to MoEFCC for Category A projects, for issue of ToR for the EIA study. Prepare EIA Report as per the TOR and submit to SEIAA / and MoEFCC For B2 projects, no EIA Report is required; appraisal and issue of EC will be based on the application form. Submit applications for other environmental related approvals to respective agencies (MPPCB, ASI etc.,)
	For projects involving facilities and/or business activities that already exist or are under construction, the borrower/client will undertake an environment and/or social compliance audit, including on-site assessment, to identify past or present concerns related to impacts on the environment, and involuntary resettlement. Where non-compliance is identified, a corrective action plan agreed on by ADB and the borrower/client will be prepared.[a]	Check the regulatory compliance of such facilities, in case of non-compliance, obtain clearances/approvals as required
	Public consultation will be carried out in a manner commensurate with the impacts of affected communities. The consultation process and its results are to be documented and reflected in the EIA/IEE.	Public (hearing) consultation and disclosure is required for A and B1 projects and consists of (i) a public hearing at or near the proposed site, and (ii) responses in writing from stakeholders.
	Disclosure: For category A: Disclosure on ADB's website of a draft full EIA (including the draft EMP) at least 120 days prior to the ADB Board consideration, and/or EARF before project appraisal where applicable; the final EIA; updated EIAs and corrective action plans; and environmental monitoring reports. For category B: Disclosure on ADB's website of the final IEE; updated IEEs and corrective action plans; and environmental monitoring reports. In addition, for all categories, environmental information will be in an accessible place and in a form or language understandable to affected person and other stakeholders. For illiterate people, other suitable communication methods will be used.	Disclosure is part the consultation. Regulatory agency discloses the Summary EIA report on their website and invites responses from stakeholders. The Draft EIA report is made available on request until the public hearing.
	Mitigation measures specified in EIA/IEE study incorporated in project design	Mitigation measures specified in EIA/IEE study incorporated in project design
	Identify and incorporate environmental mitigation and monitoring measures (including the EMP) into bid/contract documents	An EMP is required, identifying mitigation measures and specifying administrative arrangements to ensure that mitigation measures are implemented and their effectiveness is monitored after approval of the EIA. A budget for the EMP should also

Project Stage	EARF Procedure	Government of India Procedure
		be provided
Appraisal	EMP and other environmental covenants are incorporated into the legal agreement, loan/project agreement, and project administration memorandum (PAM)	EIA Report is reviewed by an Expert Appraisal Committee (EAC), constituted by MoEF for Category A projects and SEIAA for B1 projects. Applications for other clearances/approvals will be apprised by respective agencies based on submissions and site reconnaissance
Approval	ADB will review draft final reports of: (i) IEEs for the first three subprojects of each subsector (Water supply, road, drainage etc.).; and (ii) EIAs of any new subproject classified as category A..	Based on the EAC recommendation, MoEF/SEIAA will issue EC, stipulating the conditions to be met during the implementation. Concerned agencies will issue clearances/approvals, stipulating conditions
Contract award	Obtain necessary environmental clearances, consents, and no-objection certificates (NOCs) prior to contract award. Implementation of EMP, including monitoring plans based on EIA/IEE findings to be incorporated into civil works contracts.	There is no regulatory condition on contract award, but as per the EIA Notification, EC is to be obtained before any construction work or land preparation (except land acquisition) may commence. All other clearances are also to be obtained before the start of work including land clearance.
Implementation	Submission of semi-annual monitoring report to ADB, including corrective action plan where non-compliance is identified	Project proponent to submit half-yearly compliance reports in respect of the stipulated EC conditions. MoEF / SEIAA will initiate necessary action in case of non-compliance.

[a] The plan will define necessary remedial actions, the budget for such actions, and the period for resolution of noncompliance. The audit report (including corrective action plan, if any) will be made available to the public in accordance with the information disclosure requirements of Safeguard Requirements 1–3.

VI. CONSULTATION, INFORMATION DISCLOSURE AND GRIEVANCE REDRESS MECHANISM

A. Public Consultation and Information Disclosure

76. Consultation, participation, and disclosure will ensure that information is provided and feedback on proposed subproject design is sought early, right from the subproject preparation phase, so that the views/preferences of stakeholders including potential beneficiaries and affected person can be adequately considered, and continue at each stage of the subproject preparation, processing, and implementation. Meaningful stakeholder consultation and participation is part of the project preparation and implementation strategy.

77. The key stakeholders to be consulted during project preparation and implementation include:

(i) project beneficiaries, and project affected persons
(ii) elected representatives, community leaders, and representatives of community-based organizations; business & industrial associations, etc.,
(iii) relevant local NGOs;

(iv) local government and relevant government agencies, including the authorities responsible for land acquisition, protection and conservation of forests and environment, archaeological sites, religious sites, and other relevant government departments (regulatory, administration & infrastructure services related)
(v) residents, shopkeepers, and business people who live and work alongside the roads where pipes will be laid and near sites where facilities will be built; custodians, and users of socially and culturally important buildings;
(vi) Vulnerable groups, women groups etc.

78. A variety of approaches can be adopted, and stakeholders should be consulted throughout the program implementation. At minimum the following consultation activities (Table 10) should be conducted. This is indicative and project agencies can also adopt more effective methods and approaches, which are locally appropriate. Consultations shall be conducted in an atmosphere which is conducive to the development of the subprojects and beneficial to the affected persons and other stakeholders. The implementing agency will ensure that the consultations are free of coercion and intimidation, gender-inclusive, and tailored to the needs of disadvantaged and vulnerable groups.

Table 10: Proposed Public Consultation Activities

Project Stage	Consultation Activities	Remarks
Subproject preparation	Household level consultations through sample questionnaire surveys on service levels, needs, priorities for project preparation	At the start of the project
	Focus group discussions with people residing/working near the project sites	During the visits to project sites
	A town level consultation workshop with all key stakeholders	Once the draft IEE report is prepared
	Consultations with Affected persons: Affected persons shall be consulted to ensure: • incorporate their views/concerns on compensation/resettlement assistance • inclusion of vulnerable groups in project benefits; • identify assistance required by affected persons during rehabilitation, if any; and • Avoid potential conflicts for smooth project implementation. It will also provide adequate opportunities for consultation and participation to all stakeholders and inclusion of the poor, vulnerable, marginalized, and affected persons in the project process	At various stages, especially during, the preparation and implementation of resettlement plan
Subproject Implementation	Focus group discussions with the people residing/working near the project sites	During the EMP monitoring at work sites
	Informal discussions with the construction workers & construction supervision staff (contractor, consultants & PIU)	During the EMP monitoring at work sites
	Informal discussions with commuters & general public along the roads where works are implemented	During the EMP monitoring at work sites

79. The implementing agency will be responsible to conduct meaningful consultations and the proceedings and outcomes of these consultations shall be recorded. In the IEEs, summarize the manner in which consultations were conducted, key topics discussed, and the decisions arrived at. These decisions shall be incorporated into the IEEs and EMPs. Photographic records and signatures of participants shall be recorded in the IEE report.

80. Outline for preparation of minutes of stakeholder consultation meetings is given at Appendix 9.

B. Information Disclosure

81. Project related information shall be disclosed through public consultation and making relevant documents available in public locations. PMU and PIUs shall provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to affected person and other stakeholders. For illiterate people, other suitable communication methods will be used.

82. At minimum, the following documents shall be made available at the offices of project agencies - PMU, PIU and ULB offices for public reference, and shall also be uploaded on respective websites.

(i) Summary of project and draft IEE (in Hindi & English)
(ii) Draft IEE Report (in English)
(iii) Final IEE Report (in English)
(iv) Updated/amended IEE (in English)
(v) Corrective action plan prepared during project implementation (English)
(vi) Semi-annual Environmental Monitoring Reports (English)

83. A concise summary of project and draft IEE report (in Hindi), providing all necessary details of proposals, implementation arrangements, subproject locations, likely issues and mitigation and monitoring measures and grievance redress mechanism, shall be made available to the stakeholders at consultation meetings. This should also provide contact information of program agency. This summary shall also be displayed at the notice boards of ULB, PIU and other public places like Libraries for public viewing. In the course of project implementation, relevant information about any major changes to project scope will be shared with beneficiaries, affected persons, vulnerable groups, and other stakeholders.

84. The following documents will be submitted to ADB for disclosure on ADB website. MPUDC will send written endorsement to ADB for disclosing these documents.

(i) For category B projects[10]
   a. final IEE;
   b. a new or updated IEE and corrective action plan prepared during project implementation, if any; and
   c. environmental monitoring reports

C. Grievance Redress Mechanism

85. A program-specific grievance redress mechanism (GRM) shall be established to receive, evaluate, and facilitate the resolution of affected person's concerns, complaints, and grievances about the social and environmental performance at the level of the project. The following GRM

[10] Category A subprojects will not be considered for funding under MPUSIP. In case, during the implementation of MPUSIP, if a potential category A subproject is identified and approved by ADB, the following documents will be submitted to ADB for disclosure: (a). draft EIA, at least 120 days before the ADB approval, (b). final EIA, (c). a new or updated EIA and corrective action plan prepared during project implementation, if any; and, (d). environmental monitoring reports

provides a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project.

86. A common GRM will be in place for social, environmental, or any other grievances related to the project. The GRM will provide an accessible and trusted platform for receiving and facilitating resolution of affected persons' grievances related to the program. The multi-tier GRM for the project is outlined below, each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required. ULB-wide public awareness campaigns will ensure that awareness on grievance redress procedures is generated through the campaign.

87. **Who can complain:** A complaint may be brought by persons who are, or could be, "directly, indirectly, materially, and adversely" affected by the project. A complaint can be submitted on behalf of the affected person/people by a representative, provided that he or she identifies the affected person/people and includes evidence of the authority to act on their behalf.

88. **What the Grievance/Complain should contain**: Any concerns pertaining to safeguard compliance - environment, involuntary resettlement, indigenous people, design related issues, compensation, service delivery or any other issues or concerns related to the project. The complaint must contain name, date, address/contact details of the complainant, location of the problem area, along with the problem. Sample grievance registration form is at Appendix 10.

89. **Where to file a Complaint:** Complainants will have the flexibility of conveying grievances/suggestions by dropping or reporting grievance redress/suggestion forms in complaints/suggestion boxes to be installed by project at ULB offices, CM (Chief Minister) Helpline, PIU offices or by e-mail or by writing in a complaints register in the PIU offices or at construction site offices. In addition, online filing using the state's existing grievance redress mechanism or telephone helpline will also be open to use by affected persons[11].

90. **How to file a Complaint:** The application should be precise and specific. The application can be sent either by post or through electronic means or deliver personally.

(i) Offline System - The application can be made on the application form available at all accessible places (ULBs/ Office of PIUs/ construction site offices). The application should have the name and complete postal address of the applicant.
(ii) Online System - Grievances pertaining to the implementation of the project can also be filed online at the website of MPUDC or by e-mails.

91. **Documentation:** Documentation of the complaints is important and must contain name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved. PMU with the support of PIU will have the overall responsibility for timely grievance redress, and for registration of grievances, related disclosure, and communication with the aggrieved party. All the documents made available to the public at the community level (at ward offices) and will include information

[11] Government of Madhya Pradesh has a special program called Chief Minister's Monitoring Programme, which monitors development programs in the state and provides for online registration of complaints. The Public Grievance Redressal Department of GoMP clearly displays the Chief Minister's Helpline Number, through which persons may lodge complaints directly to the highest authority in the state. The website of the Public Grievance Redressal Department also provides a kiosk locator for district level grievance redress kiosks. http://www.mp.gov.in/web/guest/home.

on the contact number, address and contact person for registering grievances, and will be disseminated throughout the project area by the PIU.

92. **Grievance/Problem Redress through Participatory Process:** Efforts must be made by the PIU with the support of safeguard consultants to resolve problems amicably, conflicts through participatory process with the community and the ULBs. In case of grievances that are immediate and urgent in the perception of the complainant, the Contractor, and supervision personnel from the PIU will provide the most easily accessible or first level of contact for the quick resolution of grievances. Contact phone numbers and names of the concerned staff and contractors, will be posted at all construction sites at visible locations.

93. Following process will be followed:

(i) **1st level grievance.** In case of grievances that are immediate and urgent in the perception of the complainant, PMC supervising staff will direct the contractor to and ensures that it is resolved. If the grievance is not under the contractor scope, but under the program, PMC (field office) will resolve this issue. All the grievances should be resolved within 3 days of receipt of a complaint/grievance. The complaints/grievances received in the CM helpline that are related to MPUSIP will be referred to project GRM at this first level. CM helpline staff will be included in the GRM training so that they can identify the related grievances and forward to this project GRM.

(ii) **2nd level grievance**. All grievances that cannot be redressed at first level within 3 days will be brought to the notice of PIU and PMC Assistant Environmental Specialist. PIU will review the grievance and act appropriately to resolve it within 10 days of receipt.

(iii) **3rd level grievance**. All the grievances that are not addressed at 2nd level by PIU within in 10 days of receipt will be brought to the notice of notice of the Grievance Redressal Committee (GRC).[12] GRC will meet twice a month and determine the merit of each grievance brought to the committee. The GRC will resolve the grievance within 1 month of receiving the complaint. All decisions taken by the GRC will be communicated to complainant by the Nodal Officer.

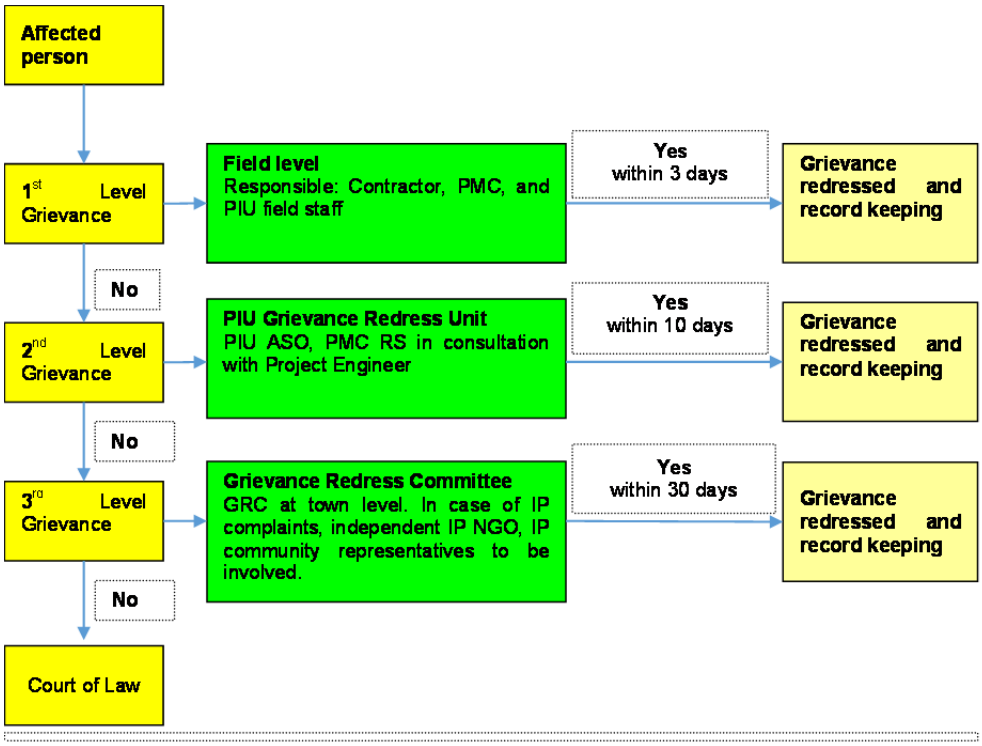
94. In case of any inter-departmental or inter-jurisdictional coordination required for resolution of specific grievances, the PIU will refer the matter directly to the PMU for state-level or inter-departmental coordination and resolution, instead of the town-level GRC. The project GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage, and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM. Alternatively, if the grievance is related to land acquisition, resettlement & rehabilitation,[13] the affected persons can approach the Land Acquisition, Rehabilitation and Resettlement Authority (LARRA). As per the latest Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation, and Resettlement Act, 2012, the state government will establish the LARRA to address grievances in implementation LARRA.

[12] Grievance redress committee (GRC) will be formed at town-level with members composed of: ULB Chairperson, ULB CMO, Environmental Specialist of PMC, PIU Deputy PM and PIU Community Development Officer. In case of any complaints by IP or members of scheduled tribes, the PIU will include as special member, a representative of an independent local NGO involved in tribal welfare. Special invitees to hearing of IP complaints will include two representatives from affected IP community and the project IP NGO, if appointed for IPP implementation.

[13] The Authority admits grievance only with reference to the LA and R&R issues under the new Act.

95. **Record-keeping.** PIU will keep records of grievances received and corrective actions and the final outcome. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PIU office, ULB office, and on the web.

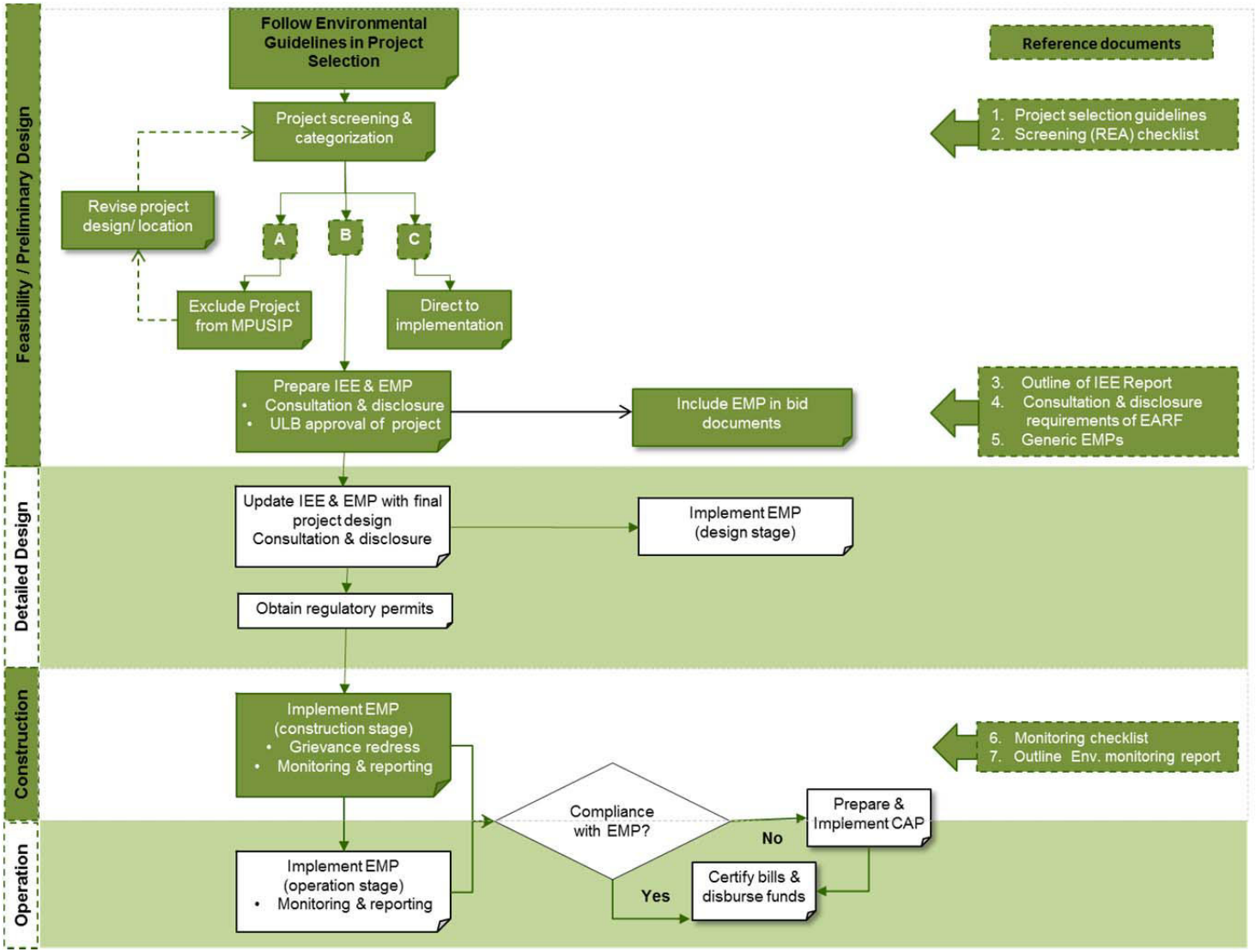
Figure 1: MPUSIP Grievance Redress Mechanism



ASO = Assistant Safeguard Officer, GRC = Grievance Redressal Committee; PMC = Project Management Consultants, PMU = Project Management Unit.

96. Safeguard implementation process under the MPUSIP is presented in the figure below.

Figure 3: Safeguard Implementation Process



VII. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

A. Implementation Arrangements

97. Urban Development and Housing Department (UDHD) of Government of Madhya Pradesh will be the Executing Agency for the Program, responsible for management, coordination and execution of all activities funded under the loan. Implementing Agency will be the recently established Madhya Pradesh Urban Development Company (MPUDC), a wholly owned subsidiary of GoMP. A central Project Management Unit (PMU) attached to MPUDC will be responsible for implementing the MPUSIP. The PMU will be supported by Program Implementation Units (PIUs) with flexibility to redeployment depending upon the implementation requirements.

98. The PMU and PIUs will be supported by several teams of Design Consultants in preparation of preliminary engineering designs.

99. Water Resource Review Committee (WRRC) is constituted to undertake a thorough review of the source when recommended by the Design Consultant in regard to techno-economic feasibility and sustainability especially ensuring climate change resilience, and Technical Review Committee (TRC) to review and approve the preliminary designs developed by the Design Consultants.

100. Project Management Consultant (PMC) centrally located in PMU and with field teams located in PIUs shall be responsible for implementation of the Program. All infrastructure contracts will be procured through performance-based contracts (PBCs) and are likely to include build-operate (BO) framework. The preparation, review, and approval of project design and due diligence studies including bidding process is centralized at the PMU. PIUs will provide necessary support to PMU in preparation, and will play main role in supervising the construction process.

101. Two Committees - an Empowered and Executive Committee and a Technical Clearance and Tender Committee have been constituted by the Government to be responsible for effective and timely implementation of the Program.

B. Safeguard Implementation Arrangement

102. **Project Management Unit.** The PMU will be staffed with two safeguard specialists: (i) Project Officer (Environment) and (ii) Social & Gender Offer and will receive support from environmental and social safeguard specialists on PMC teams. PO (Environment) will have overall responsibility in implementation of this EARF, including appropriate monitoring and reporting responsibilities. Environmental Specialist (ES) of the PMC will have primary responsibility of preparing the safeguard documents and supervising the EMP implementation, while the PO (Environment) will review, approve and oversee the compliance. Documents as required will further be submitted to ADB for approval. Key safeguard tasks and responsibilities at the PMU level are as follows:

Environmental Specialist of the PMC

(i) Prepare / update REA checklist and classify the project / confirm the category

(ii) Review project selection / design; ensure compliance with exclusion criteria and project environmental selection guidelines
(iii) Update / prepare IEE report
(iv) Conduct public consultation & information disclosure in coordination with respective PIU
(v) Provide support to PMU in obtaining government clearance/approvals
(vi) Include IEEs/EMPs in bidding documents and civil works contracts
(vii) Monitor the implementation of EMP by contractors; review, and evaluate the effectiveness with which the EMPs are implemented, and recommend corrective actions to be taken as necessary
(viii) Review monthly EMP implementation reports submitted by contractors
(ix) Review & provide guidance to contractors on environmental monitoring (air, noise, etc) as per the EMP
(x) Prepare semi-annual Environmental Monitoring Reports
(xi) Provide guidance/assistance in grievance redress
(xii) Organize an induction course for the training of contractors, preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures, and on taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation.

Project Officer (Environment) of PMU

(i) Ensure subprojects confirms to exclusion criteria and project selection guidelines
(ii) Review and approve subproject environmental category
(iii) Review and approve IEEs ensure that updated IEEs/EMPs reflect final project designs
(iv) Ensure that EMPs are included in bidding documents and civil works contracts
(v) Ensure proper implementation of EMPs by contractors
(vi) Facilitate and ensure compliance with all government rules and regulations regarding site and environmental clearances, as well as any other environmental requirements (e.g., location clearance certificates, environmental clearance certificates, etc.), as relevant
(vii) Approve monthly EMP implementation reports
(viii) Review and approve semi-annual monitoring reports prepared by PMC and submit to ADB
(ix) Ensure timely disclosure of final IEEs/EMPs in locations and form accessible to the public
(x) Oversee grievances redress process and ensure timely redress

103. **Project Implementation Units**. PIUs will be headed by a Project Manager. At each PIU, the Assistant Project Manager will be given additional responsibilities of safeguard tasks and will be designated as Assistant Environmental Officer (ASO). ASO will oversee the safeguards implementation at PIU level and report to PO (Environment) at PMU. Specifically ASO will coordinate public consultation, information disclosure, regulatory clearances and approvals, EMP implementation and grievance redress. EHS supervisor of DBO Contractor will provide all necessary assistance to ES of PMC in updating IEEs and will supervise day-to-day EMP implementation. Following are the key tasks of environmental safeguard staff at PIU:

Assistant Safeguards Office at PIU

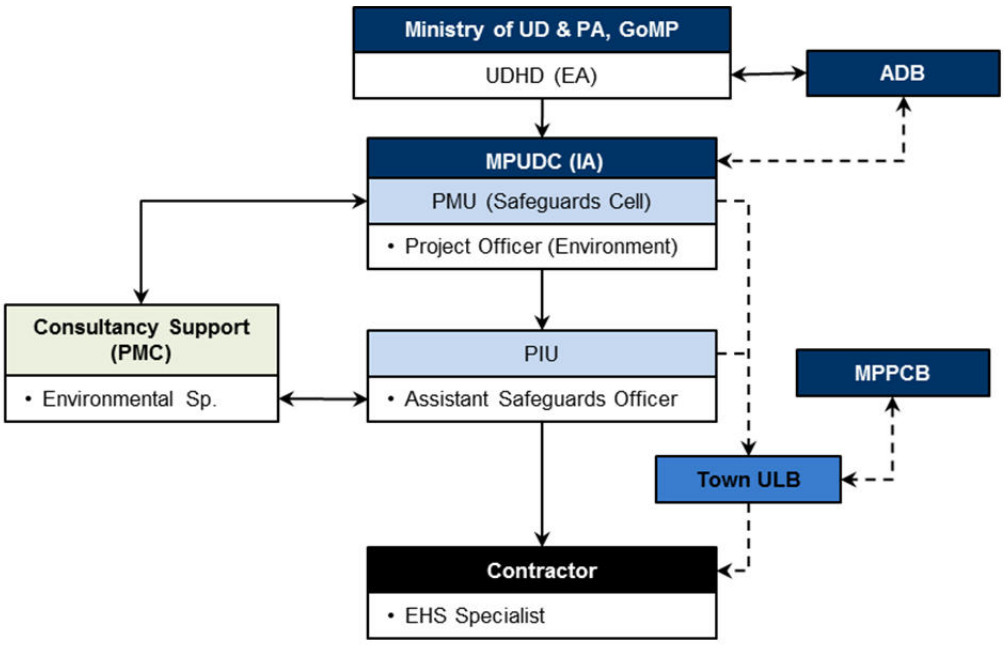
(i) Coordinate public consultation and information disclosure
(ii) Liaise with local offices of regulatory agencies in obtaining clearances /approvals
(iii) Oversee day-to-day implementation of EMPs by contractors, including compliance with all government rules and regulations, take necessary action for obtaining rights of way
(iv) Ensure continuous public consultation and awareness
(v) Coordinate grievance redress process and ensure timely actions by all parties
(vi) Review and forward Monthly EMP Monitoring Reports of Contractor to PMU

104. **Civil works contracts and contractors.** EMPs are to be included in bidding and contract documents and verified by the PIUs and PMU. The contractor will be required to designate an Environment, Health and Safety (EHS) supervisor to ensure implementation of EMP during civil works. Contractors are to carry out all environmental mitigation and monitoring measures outlined in their contract. As the contract is to be procured through build-operate framework, contractor will also responsible for operation phase EMP implementation during the 10 year O & M period, after which it will be responsibility of the respective ULB to take over and implement the O&M. Following are the key tasks of EHS supervisor:

(i) Provide necessary assistance to ES of PMC in updating the IEEs and EMPs to reflect the designs finalized by the contractor for implementation
(ii) Conduct orientation & daily briefing sessions to workers on environment, health and safety
(iii) Ensure that appropriate worker facilities are provided at the work place and labour camps as per the contractual provisions
(iv) Records accidents and undertake remedial actions
(v) Implement EMP measures and report to ASO if any new impacts are surfaced; seek guidance from ASO / ES as required in EMP implementation
(vi) Conduct environmental monitoring (air, noise etc.,) as per the monitoring plan
(vii) Ensure conduct of water quality suvillaince program
(viii) Prepare monthly EMP monitoring reports and submit to PIU

105. The PMU and PIU will ensure that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; and (c) elimination of forced labor; and with (ii) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites.

Figure 4: Safeguard Implementation Arrangements



ADB – Asian Development Bank; EHS – Environment, Health & Safety; GoMP – Government of Madhya Pradesh; IA – Implementing Agency; MPPCB – Madhya Pradesh Pollution Control Board; MPUDC –Madhya Pradesh Urban Development Company; PIU – Project Implementation Unit; PMU - Project Management Unit; PMC – Project Management Consultant; UDED – Urban Development and Housing Department; ULB – Urban Local Body

Table 113: Project Safeguard Activities, Reference Documents & Responsibility

Activity	Reference in EARF	Responsibility
Preliminary Design & Detailed Design		
Refer to subproject selection guidelines - Include design and location considerations to avoid potential environmental impacts	**Section V C 1 & 2** **Table 7:** Exclusion Criteria **Table 8:** Environment Guidelines for Project Selection	PMU / PMC
Conduct categorization	**Appendix 7:** REA Checklist	PMU / PMC
Conduct environmental assessment and prepare IEE Report	**Appendix 8:** Outline of IEE Report	
Formulate mitigation measures for potential environmental impacts which cannot be avoided thru design and change of location/s	**Appendix 11, 12, 13, 14 & 15**: Suggested Mitigation Measures for Potential Environmental Impacts	PMU / PMC
Conduct meaningful consultations with stakeholders and affected person	**Appendix 10**: Outline of Minutes of Consultation Meeting; Suggested Topics to be Discussed, Record-Keeping, Attendance Sheet	PMU / PMC

Activity	Reference in EARF	Responsibility
File application for required environmental consents/permits and Include measures to comply with conditions of consents and permits	• Consent to Establish from State Pollution Control Board • Permission from Water Resources Department for water abstraction from surface water sources (dams/reservoirs) • Tree-cutting Permit from Forest Department • ASI Clearance • State Archaeological Clearance • Etc., **Appendix 16:** ASI Application form	- PMC to assist PIU in preparation of application and supporting documents - PIU to request local body to sign applications
Bid process		
Bid evaluation	Assist in Bid Evaluation to ensure contractor shall (a) comply with the mitigation measures set forth in the EMP and any corrective or preventative actions set forth in a EMR that the PMU and PIU will prepare from time to time to monitor implementation, (b) make available a budget for all environmental measures, (c) provide PIU with a written notice of any unanticipated environmental impacts that arise during construction, implementation or operation of the subproject that were not considered in the EMP	PMC
Establish grievance redress mechanism (GRM) and ensure members of the GRM committees have capacity to address program-related issues/complaints	**Section VI C:** Grievance Redress Mechanism	PIU and local body
Construction		
Submit site-specific EMP, H&S plan, traffic management plan and list of areas for work camps, storage and disposal areas to PIU prior to start of construction	Refer to respective IEE and EMP Reports	
Implement site-specific EMP	-	
Strictly comply with H&S plan	-	
Coordinate with local body for implementation of traffic management plan	-	
Submit environmental monitoring reports	**Appendix 17**: Sample Construction Site Checklist For EMP Monitoring **Appendix 18**: Semi-annual Environmental Monitoring Report Template	
Operation		
Prior to commissioning, file application for required environmental consents/permits	For Consent to Operate WTP/STP	
Implement site-specific EMP, H&S plan and traffic management plan to PIU prior to start of construction		
Submit environmental monitoring report to PIU every 3 months	**Appendix 18**: Semi-annual Environmental Monitoring Report Template	

C. Institutional Capacity and Development

106. MPUDC is responsible for implementation of the EARF. It is responsible for preparing environmental impact assessment (EIA) or initial environmental examination (IEE) reports, monitoring of safeguards issues, providing support and guidance to ULBs concerning

performance criteria and development planning. MPUDC is supported by PMU, which was successfully implemented and ensured environmental management and monitoring under the previous ADB funded project "Urban Water Supply and Environment Improvement in Madhya Pradesh".[14]

107. In the current institutional set up, environmental safeguard related functions are housed within the Project Management Unit (PMU), and are handled by the Project officer (Environment). There is no set-up at PIU level, and all the safeguard related activities are directly handled by PO (Environment). PO will be assisted by specialist consultants in all safeguard related activities - preparation of environmental documents, obtaining regulatory clearances, implementation and monitoring of Environmental Management Plans (EMPs), etc.

108. In towns, the program will be implemented through Project Implementation Units (PIUs) and will be responsible for implementation in each cluster of towns (8-12 towns in each cluster). PIUs will be supported by consultants in all activities during the implementation, including the safeguard activities. PMU will supervise the PIUs will review and advise as required in all aspects of project implementation.

109. Subsequent to completion and commissioning, Contractors will be responsible for operation and maintenance of the improved infrastructure for ten years.

110. During the implementation phase of MPUSIP, PIUs/ULBs will be supported by specialist consultants for management and monitoring of environmental safeguards implementation. During the operation phase, considering the nature of proposed projects, the impacts are likely to be minimal, and that critical components like STPs, which may have operation stage impacts will be monitored by MPPCB. During initial seven years, the operation will be carried out by the contractor, and EHS Specialist of Contractor will review the environmental safeguard issues.

111. **Capacity Development**. To implement EARF successfully, implementing and executing agencies need to have a sustained capacity to manage and monitor environmental safeguards. Therefore the executing and implementing agencies require capacity building measures for (i) a better understanding of the project-related environmental issues; and (ii) to strengthen their role in preparation of IEE implementation of mitigation measures and subsequent monitoring. Trainings and awareness workshops are included in the program with the primary focus of enabling the MPUDC, PMU and PIU staff to conduct impact assessments and carry out environmental monitoring and implement environmental management plans (EMPs). After participating in such activities, the participants will be able to make environmental assessments for subsequent subprojects, conduct monitoring of EMPs, understand government and ADB requirements for environmental assessment, management, and monitoring (short- and long-term), and incorporate environmental features into future project designs, specifications, and tender/contract documents and carry out necessary checks and balances during project implementation..

112. The PMC environmental specialist will be responsible for training the PMU project officer (environment) and the PIUs Assistant Safeguard Officers on environmental awareness and management in accordance with the EARF requirements. External experts, if required, will be

[14] The ADB funded US $ 250 million Urban Water Supply and Environment Improvement in Madhya Pradesh (known as Project Uday) implemented in 2003-13 covered six major cities in the State – Bhopal (state capital), Indore, Jabalpur and Gwalior. The PMU also implemented a parallel 'Madhya Pradesh Urban Services for the Poor (MPUSP)' funded by DFID via a grant of $80 million for capacity building, slum rehabilitation and modernization of municipal administration in the four towns.

engaged. Typical modules would be as follows: (i) sensitization to EARF; (ii) introduction to environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. An outline training program is presented in **Table 12**.

Table 12: Training Program for Environmental Management

Description	Contents	Schedule	Participants
Pre-construction stage			
Orientation workshop	Module 1 – Orientation - Environmental Management Framework of MPUDC Module 2 – Environmental Assessment Process - identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements - Review of environmental assessment report to comply with EARF requirements - Incorporation of EMP into the project design and contracts	1 day (at Bhopal) (50 persons)	UADD, MPUDC, PMU, and PIU staff, PMC
Construction stage			
Orientation program/ workshop for contractors and supervisory staff	- Roles and responsibilities of officials/contractors/consultants towards protection of environment - Environmental issues during construction - Implementation of EMP - Monitoring of EMP implementation - Reporting requirements	1 day (at each PIU) (50 persons)	PIU staff, ULB, Contractor staff, PMC
Experiences and best practices sharing	- Experiences on EMP implementation – issues and challenges - Best practices followed	1 day on periodically to be determined by PMU, PIUs, and PMC (at Bhopal) (50 persons)	PMU PIUs Contractors PMC

D. Staffing and Budget

113. Costs required for implementing the EARF will cover the following activities:

(i) conducting environmental assessments of new subprojects, preparing and submitting reports, and public consultation and disclosure;
(ii) application for government regulatory consents, approvals; and
(iii) implementation of EMP

114. For budgeting purposes, it is assumed that all new subprojects will be classified by ADB as category B (requiring IEE). Some subprojects may require a simpler environmental review, but this is discounted for budgeting purposes.

115. Preparation of IEE requires an experienced environmental specialist for conducting the following activities: (i) site visit to assess environmental conditions and potential impacts of the scheme; (ii) liaison with ULBs and others to obtain any environmental/social data that might be available locally (e.g. population figures, designated sites, etc.); (iii) consultation with the local community to inform them about the scheme and identify their views and concerns; (iv) assessment of impacts and development of mitigation; and (v) desk study and report preparation. Environmental specialist position is created in PMC, preparation of environmental assessment reports is also part of the scope of work of design consultants. Preparation and review of documents will be as follows:

(i) Design consultants will conduct environmental assessment and prepare IEE for water supply projects in all program towns
(ii) PMC Environmental Specialist will review, finalize and submits the documents to PO (Environment) at PMU, who will approve the IEEs
(iii) PMC will conduct environmental assessment and prepare IEE for sewerage subprojects, and submits reports to PO (Environment) at PMU for approval
(iv) Public consultation and disclosure will be conducted by respective ULBs / PIUs with the assistance of DC / PMC.

116. The infrastructure involved in each scheme is generally straightforward, and will take about 2 years to build. Environmental monitoring during construction will also be straightforward, and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by PMC environment safeguard specialist.

117. The cost of mitigation measures and surveys during construction will be incorporated into the contractor's costs, which will be binding on him for implementation. The surveys will be conducted by the contractors. EMP will be included in the contracts.

118. The operation phase mitigation measures are again of good operating practices, which will be the responsibility of the Contractor for 10 years. EHS Specialist of the contractor will be responsible for operation phase mitigation measures. All monitoring during the operation and maintenance phase will be conducted by government regulatory agencies like MPPCB as per their mandate therefore, there are no additional costs.

119. The indicative costs of EARF implementation are shown in Table 13. An implementation period of 48 months is considered for the preparing following costs.

Table 13: Indicative Cost of EARF Implementation

Component	Description	Input	Cost Per Unit (INR)	Total Costs (INR)	Source of Funds
A. Full Time Staff					
PMU	Project Officer (Environment)	Full time	75,000 per month	3,600,000	MPUDC
PIU	Assistant Safeguards Officer (4 nos,)	Additional charge to Assistant PM	NA	NA	Project Incremental administration cost
ULB	None	-	-	-	-
B. Consultants					
PMC	Environmental	1 x 24 months	350,000	8,400,000	Consultant costs of

Component	Description	Input	Cost Per Unit (INR)	Total Costs (INR)	Source of Funds
A. Full Time Staff					
	Specialist		per month		project
PMC	Environmental Engineers (4 nos.)	4 x 48 months	150,000 per month	28,800,000	As above
Sub-Total				**37,200,000**	
C. Regulatory, Consultation & Monitoring Costs					
Legislation, permits, and agreements	Consent fee for WTPs, STPs, forest permission etc. (128 towns)	Lump sum	100,000 per town	12,800,000	Included in the overall project cost
Environmental monitoring	During construction	128 town	100,000 per town	12,800,000	Contractor's cost (included in project cost)
Public consultations and information disclosure	Consultation meetings, disclosure	128 towns	20,000 per town	2,560,000	PIU costs – part of incremental administration
Capacity development in environmental safeguards	Awareness and training programs - venue & other arrangements	Training workshops to all program agencies	Lump sum	500,000	PMU costs - part of incremental administration
Sub-Total				**28,660,000**	

VIII. MONITORING AND REPORTING

120. Monitoring and reporting on overall EARF compliance, subproject selection guidelines and exclusion criteria and on implementation of subproject-wise EMPs are the key tasks in safeguard implementation in MPUSIP. Through the PMU, MPUDC will monitor and measure the progress of EMP implementation. The monitoring activities will correspond with the subproject's risks and impacts. PMU, PIUs, and PMC will undertake site inspections and document review to verify compliance with the EMP.

121. PMC will submit monthly monitoring and implementation reports to PMU, who will take follow-up actions, if necessary. MPUDC will submit semi-annual monitoring reports to ADB. The suggested monitoring report format is in Appendix 18. Subproject budgets will reflect the costs of monitoring and reporting requirements. For projects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis. Monitoring reports will be posted in a location accessible to the public. Supplied water quality will be monitored to ensure that the water quality is within the acceptable guidelines. Surveillance monitoring for water sources is also proposed in the EMP. Besides EMP monitoring plan, the contractor's scope includes preparation and implementation of a water quality surveillance program including development of a water quality laboratory.

122. ADB will review project performance against UDHD commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB will carry out the following monitoring actions to supervise project implementation:

(i) conduct periodic site visits for projects with adverse environmental or social impacts;
(ii) conduct supervision missions with detailed review by ADB's safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
(iii) review the periodic monitoring reports submitted by EAs to ensure that adverse impacts and risks are mitigated, as planned and agreed with ADB;
(iv) work with EAs to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to reestablish compliance as appropriate; and
(v) prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

APPENDIX 1: TENTATIVE LIST OF PROJECT TOWNS

S. No.	Division	Name of ULB	District	Population year-2011
1	Chambal	Phuphkala	Bhind	12657
2	Chambal	Daboh	Bhind	18097
3	Chambal	Akoda	Bhind	12534
4	Chambal	Alampur	Bhind	10686
5	Chambal	Lahar	Bhind	35674
6	Chambal	Mihona	Bhind	16935
7	Gwalior	Antari	Gwalior	9949
8	Gwalior	Bilaua	Gwalior	12907
9	Gwalior	Pichhore	Gwalior	12425
10	Chambal	Jhundpura	Morena	9803
11	Chambal	Vijaypur	Sheopur	16964
12	Gwalior	Karera	Shivpuri	28705
13	Gwalior	Pichhore	Shivpuri	18127
14	Gwalior	Bairad	Shivpuri	17468
15	Gwalior	Isagarh	Ashoknagar	12583
16	Gwalior	Aron	Guna	28010
17	Ujjain	Susner	Agar	16432
18	Ujjain	Nagri	Mandsaur	7034
19	Ujjain	Neemuch	Kukdeshwar	11678
20	Ujjain	Neemuch	Athana	6456
21	Ujjain	Neemach	Sarwaniya Maharaj	6737
22	Ujjain	Nayagaon	Neemach	6699
23	Ujjain	Makdon	Ujjain	11678
24	Ujjain	Khategaon	Dewas	25412
25	Ujjain	Polaykalan	Shajapur	12268
26	Ujjain	Pankhedi	Shajapur	11723
27	Indore	Pansemal	Barwani	13100
28	Indore	Depalpur	Indore	17474
29	Indore	Chhanera	Khandwa	22052
30	Indore	Mandav	Dhar	10657
31	Bhopal	Sanchi	Raisen	8401
32	Bhopal	Kurawar	Rajgarh	22424
33	Bhopal	Rajgarh	Boda	9886
34	Bhopal	Kothari	Sehore	10535
35	Narmadapuram	Amla	Betul	30215
36	Narmadapuram	Betul Bazar	Betul	10630
37	Narmadapuram	Sarni	Betul	86141
38	Sagar	Makroniya	Sagar	150583
39	Sagar	Rahatgarh	Sagar	31537
40	Sagar	Sagar	Sagar	274556
41	Sagar	Buxwaha	Chhatarpur	10216
42	Sagar	Hatta	Damoh	32465
43	Sagar	Pawai	Panna	14465
44	Sagar	Khajuraho	Chhatarpur	24481
45	Sagar	Rajnagar	Chhatarpur	14253
46	Shahdol	Jaithari	Anuppur	8396
47	Shahdol	Khand	Shahdol	10653
48	Shahdol	Chandiya	Umariya	15891
49	Rewa	Mauganj	Rewa	26420
50	Rewa	Maihar	Satna	40192
51	Jabalpur	Barhi	Katni	17939

APPENDIX 2: WILDLIFE SANCTUARIES AND NATIONAL PARKS IN MADHYA PRADESH

National Parks
Sanctuaries

National Parks		Wildlife Sanctuaries		
1 Kanha	1. Bori	7. Ken Ghariyal	13. Panpatha	19. Son Ghariyal
2. Bandhavgarh	2. Bagdara	8. Kheoni	14. Kuno	20. Sardarpur
3 Panna	3. Phen	9. Narsinghgarh	15. Pench	21. Sailana
4 Pench	4. Ghatigaon	10. N. Chambal	16. Ratapani	22. Ralamandal
5 Satpura	5. Gandhisagar	11. Nauradehi	17. Sanjay Dubri	23. Orchha
6 Sanjay	6. Karera	12. Pachmari	18. Singhori	24. Gangau
7. Madhav				25. V. Durgawati
8 Vanvihar				
9. Fossil				

APPENDIX 3: LIST OF ARCHEOLOGICAL SURVEY OF INDIA PROTECTED MONUMENTS IN MADHYA PRADESH

S. No.	Name of Monuments / Sites	Location	District
1	Temples	Baihar	Balaghat
2	Fort	Garhi	Balaghat
3	Old Fort	Lanji	Balaghat
4	An old temple within the limits of Piparwara forest Village	Raigarh	Balaghat
5	Temple of Koteswara Mahadeva & Hanuman	Kashitola	Balaghat
6	53 images locally knows known as Sada Bhada	Sonkhar	Balaghat
7	Brick Temples (two)	Kherat	Bhind
8	Open Air Museum	Kherat	Bhind
9	Fort	Ater	Bhind
10	Kamlapati Palalce	Bhopal	Bhopal
11	Chausath Yogini Temple	Khajuraho	Chhatarpur
12	Chitragupta temple	Khajuraho	Chhatarpur
13	Chopra or square tank	Khajuraho	Chhatarpur
14	Devi Jagdambi temple	Khajuraho	Chhatarpur
15	Kandariya temple	Khajuraho	Chhatarpur
16	Lakshman temple	Khajuraho	Chhatarpur
17	Lalguan Mahadeva temple	Khajuraho	Chhatarpur
18	Mahadeva Temple	Khajuraho	Chhatarpur
19	Matangeswara Temple	Khajuraho	Chhatarpur
20	Nandi Temple	Khajuraho	Chhatarpur
21	Parvati Temple	Khajuraho	Chhatarpur
22	Varaha Temple	Khajuraho	Chhatarpur
23	Vishvanath Temple	Khajuraho	Chhatarpur
24	Adinath Temple	Khajuraho	Chhatarpur
25	Brahma Temple	Khajuraho	Chhatarpur
26	Colossal statue of Shri Hanuman	Khajuraho	Chhatarpur
27	Ghantia Temple	Khajuraho	Chhatarpur
28	Kakra Marh	Khajuraho	Chhatarpur
29	Parsvanatha Temple	Khajuraho	Chhatarpur
30	Santinatha Temple	Khajuraho	Chhatarpur
31	Vamana Temple	Khajuraho	Chhatarpur
32	Javari Temple	Khajuraho	Chhatarpur
33	Duladeo Temple	Khajuraho	Chhatarpur
34	Jatakari or Chaturbhuj Temple	Khajuraho	Chhatarpur
35	Inscription in the fort of Bachau	Bachhaon	Chhatarpur
36	Temple remains and mounds at Bjiamandal	Jatkara near Khajuraho	Chhatarpur
37	Gond Fort	Deogarh	Chhindwara
38	Nohta (Mahadeva) Temple	Nohta,	Damoh
39	Rajnagar (Ruined) Fort	Rajnagar	Damoh
40	Rangmahal Palace	Hatta	Damoh
41	(Siva) Temple of Kunora Bari	Kunora Bari	Damoh
42	Jata Shankar Fort	Jatashankar	Damoh
43	Matha at Raneh	Raneh	Damoh
44	(Siva Temple) Old Temple	Kodal	Damoh
45	The remains of an old sculptures temple built without mortar and attributed to Chandelas	Kanoda(Konora)	Damoh
46	A hill Fort	Singorgarh	Damoh
47	Ruined Fort	Mariadoh	Damoh
48	Sakhar Temple (Ruined Shiva Temple)	Sakhara	Damoh
49	Sculptures at Phutera tank	Phutera tank	Damoh
50	Flat roofed temples below the hill	Kundalpur	Damoh
51	Jain Temples on Hill No.1 to No. 58	Kundalpur	Damoh
52	Beer Singh Palace	Datia	Datia

S. No.	Name of Monuments / Sites	Location	District
53	Rock inscription (Edict) of Ashoka	Gujjara	Datia
54	Sidheshwara Temple	Nemawar,	Dewas
55	Unfinished Temple	Nemawar	Dewas
56	Alamgir Gate	Mandu	Dhar
57	Ancietn Hindu Baodi	Mandu	Dhar
58	Andheri Baoli	Mandu	Dhar
59	Asharfi Mahal	Mandu	Dhar
60	Baz Bahadur's Palace	Mandu	Dhar
61	Bhagwania Gate	Mandu	Dhar
62	Bhangi Gate	Mandu	Dhar
63	Champa Baoli	Mandu	Dhar
64	Chistikhan's Mahal	Mandu	Dhar
65	Chor Kot	Mandu	Dhar
66	Chor Kot Mosque	Mandu	Dhar
67	Nahar Jharokha compound	Mandu	Dhar
68	Dai-ka-Mahal	Mandu	Dhar
69	Daike Chhoti Behen Ka Mahal	Mandu	Dhar
70	Darya Khan's Tomb	Mandu	Dhar
71	Delhi Gate	Mandu	Dhar
72	Dharmashala in the compound of Hoshang's Tomb	Mandu	Dhar
73	Dilawar Khan's Mosque	Mandu	Dhar
74	Ek Khamba Mahal	Mandu	Dhar
75	Gada Shah's Palace	Mandu	Dhar
76	Gada Shah's Shop	Mandu	Dhar
77	Gadi Darwaza	Mandu	Dhar
78	Hammam	Mandu	Dhar
79	Hathi Pole gate	Mandu	Dhar
80	Hathi Mahal	Mandu	Dhar
81	Hindola Mahal	Mandu	Dhar
82	Hoshang Shaha’s Tomb	Mandu	Dhar
83	Jahaz Mahal	Mandu	Dhar
84	Jahangirpur gate	Mandu	Dhar
85	Jama Masjid	Mandu	Dhar
86	Kapoor Talao and the ruins on its bank	Mandu	Dhar
87	Lal Bag	Mandu	Dhar
88	Lal Bungalow	Mandu	Dhar
89	Lohani Gate	Mandu	Dhar
90	Lohani Caves	Mandu	Dhar
91	Jali Mahal	Mandu	Dhar
92	Nahar Jharokha	Mandu	Dhar
93	Mahmud Khilji's Tomb	Mandu	Dhar
94	Malik Mughith's Mosque	Mandu	Dhar
95	Mosque near Sopi Tank	Mandu	Dhar
96	Mosque North-west of Darya Khan's Tomb	Mandu	Dhar
97	Mosque near Tarapur Gate	Mandu	Dhar
98	Nameless Tomb west of Shila Tank	Mandu	Dhar
99	Neelkantha (Nilkantheswar)	Mandu	Dhar
100	Rampol gate and the mosque apposite to it	Mandu	Dhar
101	Royal Palace in the west of Champa Baoli and Hammam	Mandu	Dhar
102	Roopmati's Pavalion	Mandu	Dhar
103	Carvan Sarai	Mandu	Dhar
104	Sat kothari Caves	Mandu	Dhar
105	Somavati Kund	Mandu	Dhar
106	Songadh Gate	Mand	Dhar
107	Tarapur Gate	Mandu	Dhar
108	Tavali Mahal	Mandu	Dhar
109	Tomb & Mosque between Chor kot mosque & Chhappan mahal	Mandu	Dhar

S. No.	Name of Monuments / Sites	Location	District
110	Tomb North of Daryakhan's tomb	Mandu	Dhar
111	Tomb North of Alamgir Gate	Mandu	Dhar
112	Tripolingate	Mandu	Dhar
113	Tower of Victory	Mandu	Dhar
114	Ujali Baoli	Mandu	Dhar
115	Water palace	Mandu	Dhar
116	Ruins in the west of Rewa kund	Mandu	Dhar
117	Bhojshala and kamal Maula's Mosque	Dhar	Dhar
118	Lat- ki-Masjid	Dhar	Dhar
119	Buddhist Caves No.1 to 7	Bagh	Dhar
120	Water palace	Sadalpur	Dhar
121	Rock cut temple	Wasvi	Dhar
122	Jains temple No. 1 to 5	Budhichanderi	Ashok Nagar
123	Chanderi Fort	Chanderi	Ashok Nagar
124	Bada Madarsa	Chanderi	Ashok Nagar
125	Battisi Baoli	Chanderi	Ashok Nagar
126	Badal Mahal Gateway	Chanderi	Ashok Nagar
127	Jama Masjid	Chanderi	Ashok Nagar
128	Kati Ghati	Chanderi	Ashok Nagar
129	Koshak Mahal	Chanderi	Ashok Nagar
130	Tomb of Nizam-ud-din's	Chanderi	Ashok Nagar
131	Shahzadi ka Roza	Chanderi	Ashok Nagar
132	Monastery	Kadwaha	Ashok Nagar
133	Temple No . 2 to 7	Kadwaha	Ashok Nagar
134	Loose Sculptures	Thubon	Ashok Nagar
135	Sitamarhi Group of Temples	Thoban, Tehsil Chanderi	Ashok Nagar
136.	Hanuman Marhi Group of Temples	Thoban, Tehsil Chanderi	Ashok Nagar
137.	Hori ki Marhia Group of Temples	Thoban, Tehsil Chanderi	Ashok Nagar
138.	Gargaj and Mahadev Ghat Group of Temples	Thoban, Tehsil Chanderi	Ashok Nagar
139.	Kuti Group of Temples	Thoban, Tehsil Chanderi	Ashok Nagar
140.	Andhakuan Group of Temples	Thoban, Tehsil Chanderi	Ashok Nagar
141	Mahadeva temple	Amrol	Gwalior
142	Ancient site	Pawaya	Gwalior
143	Tila Monument	Pawaya	Gwalior
144	Tomb of Abul Fazal	Antri	Gwalior
145	Tomb of Tansen and two mosque's	Gwalior	Gwalior
146	Gwalior fort: i. Badal Mahal or Hindolagate ii Gwalior or Alamgiri gate iii Ganesa gate, iv. Chaturbhuj temple v. Lakshmangate, vi. Mansingh's palace vii. Rock-cut Jaina colossi, viii. Sas Bahu temple ix.Teli-ka-Mandir, x. Urwai Gate	Gwalior	Gwalior
147	Tomb of Mohammad Ghauz	Ghauspura	Gwalior
148	Rock Shelter	Baldeo Kundi	Gwalior
149	Caves popularly known as Pandav Caves	Pachmarhi	Hoshangabad
150	Old Mughal Fort	Joga	Hoshangabad
151	Adamgarh rock shelter with paintings	Kalmadi Rasulia	Hoshangabad
152	Rock Shelter known as Pulti lane near Sambourne cave	Karian	Hoshangabad
153	Dorothy deep Rock Shelter	Pachmarhi	Hoshangabag
154	Stature of a boar (Vishnu : Varah), an image of Mahadeo and figures of other Hindu & Jain Gods scattered over four Tumuli and under a	Karanpur	Jabalpur

S. No.	Name of Monuments / Sites	Location	District
	Bargat tree		
155	Varaha Near Karitalai	Karanpur	Bala Jabulpur
156	Tortoise & fish hereby known as Kachha & Maccha	Karitalai	Jabalpur
157	The whole site of Kankali Devi Temple and Durgadevi temple	Tigwan	Jabalpur
158	Vishnu-Varaha Temple	Bilhari	Jabalpur
159	Tapsi-Math	Bilhari	Jabalpur
160	Madan Mahal on the top of hill upon a large boulder rock	Garha	Jabalpur
161	Temple of Somnath and ruins of several temples	Bargaon	Jabalpur
162	Rock edict of Ashoka, Rupnath	Padaria	Jabalpur
163	Ruined temple near the sources of the Kiyan river	Marha Deori	Jabalpur
164	Shiva Temple on a craved stone chabutra measuring 10' x 10' 4' and 8 stone Jain Images	Nanhwara	Jabalpur
165	Karanbel (Tripuri)	Tewar	Jabalpur
166	Temple of Gauri Shankar within the Chausath Yogini	Bheraghat	Jabalpur
167	Temple of Chausath Yogini	Bheraghat	Jabalpur
168	Large effiggy on Vishnu Varaha	Panagarh	Jabalpur
169	Ancient Mound	Kakarehta	Jabalpur
170	Ladaki Ka Tila	Bilhari	Katni
171	Rammukteswara Temple	Kukaramath	Mandla
172	Gond fort called Satkhanda and the twoer on Rajghat called Shahburja and the temple inside the fort	Mandla	Mandla
173	Begum Mahal	Chaugan ding dindori	Mandla
174	Sporting Palace by name Dal-Badal	Chaugan ding dindori	Mandla
175	Shiva's temple	Khaddeori	Mandla
176	Brahmanical Rock temple	Dhamnar	Mandsaur
177	Buddhist Caves (No. 1 to 51)	Dhamnar	Mandsaur
178	Nav Toran temple	Khor	Mandsaur
179	Yashodharman's pillar of Victory	Sondhani	Mandsaur
180	Ekattatso Mahadeva temple	Mitaoli	Morena
181	Gadhi	Padavali	Morena
182	Temple	Padavali	Morena
183	Siva temple (Locally known as Kakanmath temple)	Suhania	Morena
184	Temple No. 1 to 22	Naresar	Morena
185	Group of temples	Bateshwar	Morena
186	Tomb of Shah Nawaz Khan	Bhurhanpur	Burahanpur
187	Tomb of Adil Shah Faruki	Bhurhanpur	Burahanpur
188	Tomb of Shah Shuja & compound	Bhurhanpur	Burahanpur
189	Tomb of Nadir Shah & compound	Bhurhanpur	Burahanpur
190	Raja's Chhatari near Bardhaghat	Bhurhanpur	Burahanpur
191	Bibi -Sahib's Masjid and compound	Bhurhanpur	Burahanpur
192	The palace situated in the fort	Bhurhanpur	Burahanpur
193	Hammam Khana	Chowk Mohalla	Burahanpur
194	Tomb of Shah Numa	Asirgarh	Burahanpur
195	Churiwalonki Masjid	Burhanpur	Burahanpur
196	The Whole fort including all walls	Asirgarh	Burahanpur
197	Mahadeva temple near Inspection Bungalow with compound wall	Asirgarh	Burahanpur
198	Idgah, front wall with open platform	Asirgarh	Burahanpur
199	Mhal Gulara palaces and building on both sides of Utoali river and two masonary dams in the river	Mahal Gulara	Burahanpur
200	Ahukhana site with compound wall , the pavilion and tank	Anukhana	Burahanpur
201	Chaubis avtar temple with its contents	Mandhata	Nimar (East)
202	Chand Suraj Gateway	Mandhata	Nimar (East)
203	Siddeswara of Sidhanath tempe	Mandhata	Nimar (East)
204	Mamleshwara alias amleswara temple	Mandhata	Nimar (East)
205	Chaubara Dara	Khargaon	Nimar West

S. No.	Name of Monuments / Sites	Location	District
206	Jain tempe No. 1 to 3	Khargaon	Nimar West
207	Temple of Mahakaleswara No.1&2	Khargaon	Nimar West
208	Temple of Nilkantheswara	Khargaon	Nimar West
209	Excavated site	Kasrawad	Nimar West
210	Brindaban dedicated to the memory of srimant Bajirao Peshwa	Raverkhedi	Nimar West
211	Main gate and remaining portion of the Peshwa residence or fortress	Raverkhedi	Nimar West
212	The Chhatri inside the Sarai	Raverkhedi	Nimar West
213	Old Sarai	Raverkhedi	Nimar West
214	Ajaigarh fort and its remains	Ajaigarh	Panna
215	Two termples ascribed to Gupta peiod	Ajaigarh	Panna
216	Parvati temple	Nachna	Panna
217	Chaumukhnath temple	Nachna	Panna
218	i. Saivite temple ii. Ancient Rock Engravings	Bhojpur	Raisen
219	Fort (including walls Gates and other ruins monuments in the fort)	Raisen	Raisen
220	Buddhist monuments	Sanchi	Raisen
221	Buddhist stupas with adjucent land	Sonari	Raisen
222	Buddhist stupas	Muralkhurd	Raisen
223	Buddhist stupas and remains	Andher	Raisen
224	Stupa and other remains	Sonbhadra	Raisen
225	Pre - historic rock shelters	Bhimbetka	Raisen
226	Inscriptions	Alhaghat	Rewa
227	Fresce paintings	Gahir	Rewa
228	Gurgi & Rohunta remains	Gurgi	Rewa
229	Inscription in Cave	Keoti	Rewa
230	Rock Shelters with megaliths, monasteries and inscriptions	Barhat	Rewa
231	Temple	Bamora	Sagar
232	Fort	Deori	Sagar
233	Fort	Dhamoni	Sagar
234	Tomb and Mosque of balijati Shah	Dhamoni	Sagar
235	Rani Mahal	Dhamoni	Sagar
236	Ancient site	Eran and Pahlezpur	Sagar
237	All structure in or connectuion with the Mahal(fort of the Dangri rulers (Shish Mahal)	Garhpehra	Sagar
238	Fort	Gourjhamar	Sagar
239	Temple of Mahadeo or Mata	Maronda	Sagar
240	Satgarh	Maronda	Sagar
241	Tomb of Panj pirs	Khimalasa	Sagar
242	The walls of the city with gate	Khimalasa	Sagar
243	The walls of the citaded(fort)	Khimalasa	Sagar
244	Old Mosque well, gateway of the fort & Nagina Mahal	Khimalasa	Sagar
245	Mahadeva temple	Pali	Sagar
246	Fort including the monuments inside namely i) Two Gates, ii) Moti Mahal iii) Dargah of Gulmali Shah & three graves iv) Shish Mahal, v) Small Mosque vi) Dargah in ruins, vii) Samadhi viii)Dohla tank, ix) Ruined Palace x) Badal Mahal together with adjacent land	Rahatgarh	Sagar
247	Buddhist Remains	Barhut	Satna
248	Remains (Shiv Temple)	Bhumra	Satna
249	Durga Temple	Ashta	Seoni
250	Standing Jain Image of Digamber Sect known as Nagbaba and the various fragmentary stone images and architectural stone pieces	Ghansor	Seoni
251	Karna Temple	Amarkantak	Anuppur
252	Siva Temple	Amarkantak	Anuppur
253	Pataleswara Temple	Amarkantak	Anuppur

S. No.	Name of Monuments / Sites	Location	District
254	Caves bearing insciptions of last Century AD	Silhara	Shahdol
255	Virath Temple and remains	Sohagpur	Shahdol
256	Large Siva Temple	Mahua	Shivpuri
257	Small Siva Temple	Mahua	Shivpuri
258	Monastery (Khokhaimath)	Ranod	Shivpuri
259	Monastery	Surwaya	Shivpuri
260	Siva Temple	Surwaya	Shivpuri
261	Open Air Museum	Surwaya	Shivpuri
262	Gadhi Surways	Surwaya	Shivpuri
263	Mohajamata temple	Terahi	Shivpuri
264	Monastery	Terahi	Shivpuri
265	Torana gate	Terahi	Shivpuri
266	Siva temple& Monastery	Chandrehi	Sidhi
267	Buddhist stupas alongwith saru-maru monastric complex	panguraria	Sehore
268	Painted Rock Shelters, Buddhist stupas and other remains	Talpura	Sehore
269	Ancient Mound	Bhairgarh	Ujjain
270	Ancient Mound (Vishya Tekri)	Undasa	Ujjain
271	Ancient Mound(Kumbhar tekri)	Undasa	Ujjain
272	Bijamandal Mosque	Vidisha	Vidisha
273	Lohanji Hill Capital	Vidisha	Vidisha
274	Dashavatqra temple	Badoh	Vidisha
275	Jain temple	Badoh	Vidisha
276	Gadarmal temple	Badoh	Vidisha
277	Ancient Site	Besnagar	Vidisha
278	Heliodours Pillars locally known as Khan	Besnagar	Vidisha
279	Athakamba temple	Gyaraspur	Vidisha
280	Bajramath temple	Gyaraspur	Vidisha
281	Hindola torans	Gyaraspur	Vidisha
282	Buddhist stupa	Gyaraspur	Vidisha
283	Mala Devi temple	Gyaraspur	Vidisha
284	Bhimagaja	Pathari	Vidisha
285	Caves	Pathari	Vidisha
286	Caves No. 1 to 20	Udaygiri	Vidisha
287	Ruins of a Gupta temple on hill top	Udaygiri	Vidisha
288	Bara Khambi	Udaypur	Vidisha
289	Udayaswara or Hilkanthanswara Mahadeva Temple.	Udaypur	Vidisha
290	Town Hall alias Gandhi Bhawan	Shivpuri	Shivpuri
291	Prehistoric Painted Rock Shelters at Chatarbhuj Nala	Bhanpura	Mandsaur
292	Prehistoric Painted Rock Shelters at Sita Khardi	Bhanpura	Mandsaur

Source: Archeological Survey of India.

APPENDIX 4: ENVIRONMENTAL STANDARDS

General Standards for Discharge of Environmental Pollutants (Wastewater)

S. No.	Parameter	Inland surface water	Public sewers	Land for irrigation
.	2		3	.
.	.	(a)	(b)	(c)
1	Suspended solids mg/l, max.	100	600	200
2	Particle size of suspended solids	shall pass 850 micron IS Sieve	-	-
3	pH value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
4	Temperature	shall not exceed 5oC above the receiving water temperature		
5	Oil and grease, mg/l max,	10	20	10
6	Total residual chlorine, mg/l max	1.0	-	-
7	Ammonical nitrogen (as N),mg/l, max.	50	50	-
8	Total kjeldahl nitrogen (as N);mg/l, max. mg/l, max.	100	-	-
9	Free ammonia (as NH3), mg/l,max.	5.0	-	-
10	Biochemical oxygen demand (3 days at 27oC), mg/l, max.	30	350	100
11	Chemical oxygen demand, mg/l, max.	250	-	-
12	Arsenic(as As).	0.2	0.2	0.2
13	Mercury (As Hg), mg/l, max.	0.01	0.01	-
14	Lead (as Pb) mg/l, max	0.1	1.0	-
15	Cadmium (as Cd) mg/l, max	2.0	1.0	-
16	Hexavalent chromium (as Cr + 6),mg/l, max.	0.1	2.0	-
17	Total chromium (as Cr) mg/l, max.	2.0	2.0	-
18	Copper (as Cu)mg/l, max.	3.0	3.0	-
19	Zinc (as Zn) mg/l, max.	5.0	15	-
20	Selenium (as Se)	0.05	0.05	-
21	Nickel (as Ni) mg/l, max.	3.0	3.0	-
22	Cyanide (as CN) mg/l, max.	0.2	2.0	0.2
23	Fluoride (as F) mg/l, max.	2.0	15	-
24	Dissolved phosphates (as P),mg/l, max.	5.0	-	-
25	Sulphide (as S) mg/l, max.	2.0	-	-
26	Phenolic compounds (as C6H50H) mg/l, max.	1.0	5.0	-
27	Radioactive materials: (a) Alpha emitters micro curie mg/l, max. (b)Beta emitters micro curie mg/l	10^{-7} 10^{-6}	10^{-7} 10^{-6}	10^{-8} 10^{-7}
28	Bio-assay test	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent
29	Manganese	2 mg/l	2 mg/l	-
30	Iron (as Fe)	3mg/l	3mg/l	-
31	Vanadium (as V)	0.2mg/l	0.2mg/l	-
32	Nitrate Nitrogen	10 mg/l	-	-

Standards for Composting

As there are no specific standards notified for sludge reuse, the compost quality standards notified under the Municipal Solid Waste Management & Handling Rules, 2000 have been adopted here. The Municipal Solid Waste (Management and Handling) Rules stipulate that “In order to ensure safe application of compost, the following specifications for compost quality shall be met”:

Parameters	Concentration not to exceed (mg/kg dry basis, except pH value and C/N ratio) *
Arsenic	10.00
Cadmium	5.00
Chromium	50.00
Copper	300.00
Lead	100.00
Mercury	0.15
Nickel	50.00
Zinc	1000.00
C/N ratio	20-40
PH	5.5-8.5
Arsenic	10.00

*Compost (final product) exceeding the above stated concentration limits shall not be used for food crops. However, it may be utilized for purposes other than growing food crops.

Source: Municipal Solid Waste (Management & Handling) Rules, 2000, Government of India

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
		24 hours**	80	80	-Ultraviolet fluorescence
2	Nitrogen Dioxide (NO_2), µg/m³	Annual*	40	30	- Modified Jacob & Hochheiser (Na-Arsenite)
		24 hours**	80	80	- Chemiluminescence
3	Particulate Matter (size less than 10µm) or PM_{10} µg/m³	Annual*	60	60	- Gravimetric - TOEM
		24 hours**	100	100	- Beta attenuation
4	Particulate Matter (size less than 2.5µm) or $PM_{2.5}$ µg/m³	Annual*	40	40	- Gravimetric - TOEM
		24 hours**	60	60	- Beta attenuation
5	Ozone (O_3) µg/m³	8 hours**	100	100	- UV photometric - Chemilminescence
		1 hour**	180	180	- Chemical Method
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
		24 hours**	400	400	-Indophenol blue method
9	Benzene (C_6H_6) µg/m³	Annual*	05	05	- Gas chromatography based continuous analyzer - 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. — Whenever 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 institute regular or continuous monitoring and further investigation.

Ambient Noise Standards

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.

Surface Water Quality Classification Criteria

Designated-Best-Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20°C 2mg/l or les
Outdoor bathing (Organized)	B	Total Coliforms Organism MPN/100ml shall be 500 or less pH between 6.5 and 8.5 Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100ml shall be 5000 or less pH between 6 to 9 Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wild life and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C micro mhos/cm Max.2250 Sodium absorption Ratio Max. 26 Boron Max. 2mg/l

Source: Central Pollution Control Board
MPN = Most Probable Number

Vehicle Exhaust Emission Norms

1. Passenger Cars

Norms	CO(g/km)	HC+ NOx (g/km)
1991Norms	14.3-27.1	2.0(Only HC)
1996 Norms	8.68-12.40	3.00-4.36
1998Norms	4.34-6.20	1.50-2.18
India stage 2000 norms	2.72	0.97
Bharat stage-II	2.2	0.5
Bharat Stage-III	2.3	0.35(combined)
Bharat Stage-IV	1.0	0.18(combined)

2. Heavy Diesel Vehicles

Norms	CO (g/kmhr)	HC (g/kmhr)	NOx (g/kmhr)	PM (g/kmhr)
1991Norms	14	3.5	18	-
1996 Norms	11.2	2.4	14.4	-
India stage 2000 norms	4.5	1.1	8.0	0.36
Bharat stage-II	4.0	1.1	7.0	0.15
Bharat Stage-III	2.1	1.6	5.0	0.10
Bharat Stage-IV	1.5	0.96	3.5	0.02

Source: Central Pollution Control Board

CO = Carbon Monoxide; g/kmhr = grams per kilometer-hour; HC = Hydrocarbons; NOx = oxides of nitrogen; PM = Particulates Matter

APPENDIX 5: EXTRACT FROM CONSTRUCTION AND DEMOLITION MANAGEMENT RULES, 2016

[Published In the Gazette of India, Part-II, Section-3, Sub-section (ii)]
Ministry of Environment, Forest and Climate Change

NOTIFICATION

New Delhi, the 29th March, 2016

G.S.R. 317(E).-Whereas the Municipal Solid Wastes (Management and Handling) Rules, 2000 published vide notification number S.O. 908(E), dated the 25th September, 2000 by the Government of India in the erstwhile Ministry of Environment and Forests, provided a regulatory frame work for management of Municipal Solid Waste generated in the urban area of the country;

And whereas, to make these rules more effective and to improve the collection, segregation, recycling, treatment and disposal of solid waste in an environmentally sound manner, the Central Government reviewed the existing rules and it was considered necessary to revise the existing rules with a emphasis on the roles and accountability of waste generators and various stakeholders, give thrust to segregation, recovery, reuse, recycle at source, address in detail the management of construction and demolition waste.

And whereas, the draft rules, namely, the Solid Waste Management Rules, 2015 with a separate chapter on construction and demolition waste were published by the Central Government in the Ministry of Environment, Forest and Climate Change vide G.S.R. 451 (E), datedthe 3rd June, 2015 inviting objections or suggestions from the public within sixty days from the date of publication of the said notification;

And Whereas, the objections or suggestions received within the stipulated period were duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sections 6, 25 of the Environment (Protection) Act, 1986 (29 of 1986), and in supersession of the Municipal Solid Wastes (Management and Handling) Rules, 2000, except as respect things done or omitted to be done before such supersession, the Central Government hereby notifies the following rules for Management of Construction and Demolition Waste –

1. Short title and commencement.-(1) These rules shall be called the Construction and Demolition Waste Management Rules, 2016.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. Application.-The rules shall apply to every waste resulting from construction, re-modeling, repair and demolition of any civil structure of individual or organisation or authority who generates construction and demolition waste such as building materials, debris, rubble.

3. Definitions –(1) In these rules, unless the context otherwise requires,-

(a) " ACT' means the Environment (Protection) Act, 1986 (29 of 1986);

(b) "**construction**" means the process of erecting of building or built facility or other structure, or

building of infrastructure including alteration in these entities,;

(c) **"construction and demolition waste"** means the waste comprising of building materials, debris and rubble resulting from construction, re-modeling, repair and demolition of any civil structure;

(d) **"de-construction"** means a planned selective demolition in which salvage, re-use and recycling of the demolished structure is maximized;

(e) **"demolition"** means breaking down or tearing down buildings and other structures either manually or using mechanical force (by various equipment) or by implosion using explosives.

(f) **"form" means a Form annexed to these rules;**

(g) **"local authority"** means an urban local authority with different nomenclature such as municipal corporation, municipality, nagarpalika, nagarnigam, nagarpanchayat, municipal council including notified area committee and not limited to or any other local authority constituted under the relevant statutes such as gram panchayat, where the management of construction and demolition waste is entrusted to such agency;

(h) **" schedule"** means a schedule annexed to these rules;

(i) **"service provider'** means authorities who provide services like water, sewerage, electricity, telephone, roads, drainage etc. often generate construction and demolition waste during their activities, which includes excavation, demolition and civil work;

(j) **"waste generator" means any person or association of persons** or institution, residential and commercial establishments including Indian Railways, Airport, Port and Harbour and Defence establishments who undertakes construction of or demolition of any civil structure which generate construction and demolition waste.

(2) Words and expressions used but not defined herein shall have the same meaning defined in the ACT.

(4) Duties of the waste generator -

(1) Every waste generator shall prima-facie be responsible for collection, segregation of concrete, soil and others and storage of construction and demolition waste generated, as directed or notified by the concerned local authority in consonance with these rules.

(2) The generator shall ensure that other waste (such as solid waste) does not get mixed with this waste and is stored and disposed separately.

(3) Waste generators who generate more than 20 tons or more in one day or 300 tons per project in a month shall segregate the waste into four streams such as concrete, soil, steel, wood and plastics, bricks and mortar and shall submit waste management plan and get appropriate approvals from the local authority before starting construction or demolition or remodeling work and keep the concerned

authorities informed regarding the relevant activities from the planning stage to the implementation stage and this should be on project to project basis.

(4) Every waste generator shall keep the construction and demolition waste within the premise or get the waste deposited at collection centre so made by the local body or handover it to the authorised processing facilities of construction and demolition waste; and ensure that there is no littering or deposition of construction and demolition waste so as to prevent obstruction to the traffic or the public or drains.

(5) Every waste generator shall pay relevant charges for collection, transportation, processing and disposal as notified by the concerned authorities; Waste generators who generate more than 20 tons or more in one day or 300 tons per project in a month shall have to pay for the processing and disposal of construction and demolition waste generated by them, apart from the payment for storage, collection and transportation. The rate shall be fixed by the concerned local authority or any other authority designated by the State Government.

(5) Duties of service provider and their contractors -

(1) The service providers shall prepare within six months from the date of notification of these rules, a comprehensive waste management plan covering segregation, storage, collection, reuse, recycling, transportation and disposal of construction and demolition waste generated within their jurisdiction.

(2) The service providers shall remove all construction and demolition waste and clean the area every day, if possible, or depending upon the duration of the work, the quantity and type of waste generated, appropriate storage and collection, a reasonable timeframe shall be worked out in consultation with the concerned local authority.

(3) In case of the service providers have no logistics support to carry out the work specified in sub-rules (1) and (2) , they shall tie up with the authorised agencies for removal of construction and demolition waste and pay the relevant charges as notified by the local authority.

(6) Duties of local authority-The local authority shall,-

(1) issue detailed directions with regard to proper management of construction and demolition waste within its jurisdiction in accordance with the provisions of these rules and the local authority shall seek detailed plan or undertaking as applicable, from generator of construction and demolition waste;

(2) chalk out stages, methodology and equipment, material involved in the overall activity and final clean up after completion of the construction and demolition ;

(3c) seek assistance from concerned authorities for safe disposal of construction and demolition waste contaminated with industrial hazardous or toxic material or nuclear waste if any;

(4) shall make arrangements and place appropriate containers for collection of waste and shall remove at regular intervals or when they are filled, either through own resources or by appointing private operators;

(5) shall get the collected waste transported to appropriate sites for processing and disposal either through own resources or by appointing private operators;

(6) shall give appropriate incentives to generator for salvaging, processing and or recycling preferably in-situ;

(7) shall examine and sanction the waste management plan of the generators within a period of one month or from the date of approval of building plan, whichever is earlier from the date of its submission;

(8) shall keep track of the generation of construction and demolition waste within its jurisdiction and establish a data base and update once in a year;

(9) shall device appropriate measures in consultation with expert institutions for management of construction and demolition waste generated including processing facility and for using the recycled products in the best possible manner;

(10) shall create a sustained system of information, education and communication for construction and demolition waste through collaboration with expert institutions and civil societies and also disseminate through their own website;

(11) shall make provision for giving incentives for use of material made out of construction and demolition waste in the construction activity including in non-structural concrete, paving blocks, lower layers of road pavements, colony and rural roads.

(7) Criteria for storage, processing or recycling facilities for construction and demolition waste and application of construction and demolition waste and its products-

(1) The site for storage and processing or recycling facilities for construction and demolition waste shall be selected as per the criteria given in **Schedule I**;

(2) The operator of the facility as specified in sub- rules (1) shall apply in **Form I** for authorization from State Pollution Control Board or Pollution Control Committee.

(3) The operator of the facility shall submit the annual report to the State Pollution Control Board in **Form II.**

(3) Application of materials made from construction and demolition waste in operation of sanitary landfill shall be as per the criteria given in **Schedule II.**

(8) Duties of State Pollution Control Board or Pollution Control Committee-

(1) State Pollution Control Board or Pollution Control Committee shall monitor the implementation of these rules by the concerned local bodies and the competent authorities and the annual report shall be sent to the Central Pollution Control Board and the State Government or Union Territory or any other State level nodal agency identified by the State Government or Union Territory administration for generating State level comprehensive data. Such reports shall also contain the comments and suggestions of the State Pollution Control Board or Pollution Control Committee with respect to any comments or changes required;

(2) State Pollution Control Board or Pollution Control Committee shall grant authorization to construction and demolition waste processing facility in **Form-III** as specified under these rules after examining the application received in **Form I**;

(3) State Pollution Control Board or Pollution Control Committee shall prepare annual report in **Form IV** with special emphasis on the implementation status of compliance of these rules and forward report to Central Pollution Control Board before the 31st July for each financial year.

(9) Duties of State Government or Union Territory Administration-

(1) The Secretary in-charge of development in the State Government or Union territory administration shall prepare their policy document with respect to management of construction and demolition of waste in accordance with the provisions of these rules within one year from date of final notification of these rules.

(2) The concerned department in the State Government dealing with land shall be responsible for providing suitable sites for setting up of the storage, processing and recycling facilities for construction and demolition waste.

(3) The Town and Country planning Department shall incorporate the site in the approved land use plan so that there is no disturbance to the processing facility on a long term basis.

(4) Procurement of materials made from construction and demolition waste shall be made mandatory to a certain percentage (say 10-20%) in municipal and Government contracts subject to strict quality control.

(10) Duties of the Central Pollution Control Board - (1) The Central Pollution Control Board shall,-

(a) prepare operational guidelines related to environmental management of construction and demolition waste management;

(b) analyze and collate the data received from the State Pollution Control Boards or Pollution Control Committee to review these rules from time to time;

(c) coordinate with all the State Pollution Control Board and Pollution Control Committees for any matter related to development of environmental standards;

(d) forward annual compliance report to Central Government before the 30th August for each financial year based on reports given by State Pollution Control Boards of Pollution Control Committees.

(11) Duties of Bureau of Indian Standards and Indian Roads Congress -The Bureau of Indian Standards and Indian Roads Congress shall be responsible for preparation of code of practices and standards for use of recycled materials and products of construction and demolition waste in respect of construction activities and the role of Indian Road Congress shall be specific to the standards and practices pertaining to construction of roads.

Schedule III
Timeframe for Planning and Implementation
[See Rule 13]

Sl. No.	Compliance Criteria	Cities with population of 01 million and above	Cities with population of 0.5-01 million	Cities with population of less than 0.5 million
1	Formulation of policy by State Government	12 months	12 months	12 months
2	Identification of sites for collection and processing facility	18 months	18 months	18 months
3	Commissioning and implementation of the facility	18 months	24 months	36 months
4	Monitoring by SPCBs	3 times a year – once in 4 months	2 times a year – once in 6 months	2 times a year – once in 6 months

The time Schedule is effective from the date of notification of these rules.

FORM – I
See [Rule 7 (2)]
Application for obtaining authorisation

To,
The Member Secretary

_____Name of the local authority or Name of the agency appointed by the municipal authority :

Correspondence address Telephone No. Fax No.	
Nodal Officer and designation (Officer authorized by the competent authority or agency responsible for operation of processing or recycling or disposal facility)	
Authorisation applied for (Please tick mark)	Setting up of processing or recycling facility of construction and demolition waste
Detailed proposal of construction and demolition waste processing or recycling facility to include the following Location of site approved and allotted by the Competent Authority. Average quantity (in tons per day) and composition of construction and demolition waste to be handled	

APPENDIX 6: DRINKING WATER STANDARDS

No.	Substance or characteristic	Requirement Desirable limit	Undesirable effect outside the desirable	Permissible limit in the absence of alternate Source	Remarks
Essential Characteristic					
1.	Color Hazen Units, Max	5	Above 5, consumer acceptance decreases	25	Extended to 25 only if toxic Substance are not suspect in absence of alternate sources
2.	Odor	Unobjectionable	-	-	a) test cold and when heated b) test are several dilutions
3.	Taste	Agreeable	-	-	Test to be conducted only after safely has been established
4.	Turbidity (NTU) Max	5	Above 5, consumer acceptance decreases	10	-
5.	pH value	6.5 to 8.5	Beyond this range the water will after the mucous membrane and/or water supply system	No relaxation	-
6.	Total Hardness (mg/L) CaCO3	300	Encrustation in water supply structure and adverse effects on domestic use	600	-
7.	Iron (mg/L, Fe) Max	0.3	Beyond this limit taste/appearance are affected; has adverse effects on domestic uses and water supply structure and promotes iron bacteria	1.0	-
8.	Chlorides 250 (mg/L, Cl) Max	250	Beyond effects outside the desirable limit	1000	-
9.	Residual free Chlorine (mg/L), Max	0.2	-	-	To be applicable only when water is chlorinated. Tested at customer end. When protection against viral infection is required, it should be min. 0.5 mg/L.
Desirable Characteristics					
10.	Dissolved solids mg/L. Max	500	Beyond this, palatability decreases and may cause gastrointestinal irritation.	2000	-
11.	Calcium (mg/L, Ca) Max.	75	Encrustation in water supply structure and adverse effects on domestic use.	200	-
12.	Magnesium (mg/L, Mg) Max	30	Encrustation in water supply structure and adverse effects on domestic use.	100	-
13.	Copper (mg/L, Cu) Max	0.05	Astringent taste dis coloration and corrosion of pipes fittings and utensils will be caused beyond this.	1.5	-

No.	Substance or characteristic	Requirement Desirable limit	Undesirable effect outside the desirable	Permissible limit in the absence of alternate Source	Remarks
14.	Manganese (mg/L, Mn) Max	0.1	Beyond this limit taste/appearance are affected, has adverse effect on domestic use and water supply structure	0.3	-
15.	Sulphate (mg/L, SO4) Max.	200	Beyond this causes gastro intestinal irritation when magnesium or sodium are present	400	May be extended upto 400 provided magnesium (as Mg) does not exceed 30
16.	Nitrate (mg/L, NO3) Max.	45	Beyond this methaemo globinemia takes place.	100	-
17.	Fluoride (mg/L, F) Max.	1.0	Fluoride may be kept as low as possible. High fluoride may cause fluorosis.	1.5	-
18.	Phenolic Compounds (mg/L C6H5OH) Max.	0.001	Beyond this, it may cause objectionable taste and odor	0.002	-
19.	Mercury (mg/L Hg) Max	0.001	Beyond this the water becomes toxic	No Relaxation.	To be tested when pollution is suspected
20	Cadmium (mg/L, Cd) Max	0.01	Beyond this the water becomes toxic	No Relaxation.	To be tested when pollution is suspected
21.	Selenium (mg/L, Se) Max	0.01	Beyond this the water becomes toxic.	No Relaxation.	To be tested when pollution is suspected
22.	Arsenic (mg/L, As) Max.	0.05	Beyond this the water becomes toxic	No Relaxation	To be tested when pollution is suspected
23.	Cyanide	0.05	Beyond this the water becomes toxic	No Relaxation	To be tested when pollution is suspected
24.	Lead (mg/L Pb) Max.	0.05	Beyond this the water becomes toxic	No Relaxation	To be tested when pollution is suspected
25.	Zinc (mg/L, Zn) Max.	5	Beyond this limit it can cause astringent taste and an opalescence in water	15	To be tested when pollution is suspected
26.	Anionic detergents (mg/L, MBAS) Max	0.2	Beyond this limit it can cause a light froth in water	1.0	To be tested when pollution is suspected
27.	Chromium (mg/L, Cr6+	0.05	May be carcinogenic above this limit	-	-
28.	Polynuclear Aromatic Hydrocarbons (mg/l, PAH) Max	-	May be carcinogenic	-	-
29.	Mineral oil (mg/L)	0.01	Beyond this limit, undesirable taste and odor after chlorination takes place	0.03	To be tested when pollution is suspected
30.	Pesticides (mg/L) max	Absent	Toxic	0.001	-
Radioactive materials					
31.	Alpha emitters Bq/L Max	-	-	0.1	-
32.	Beta emitters Pci/L Max	-	-	1.0	-
33.	Alkalinity (mg/L,) Max	200	Beyond this limit, taste becomes unpleasant	600	-
34.	Aluminum (mg/L,	0.03	Cumulative effect is	0.2	

No.	Substance or characteristic	Requirement Desirable limit	Undesirable effect outside the desirable	Permissible limit in the absence of alternate Source	Remarks
	Al) Max		reported to cause dementia		
35.	Boron (mg/L) Max	1.0	-	5.0	-

APPENDIX 7: RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST

Madhya Pradesh Urban Services Improvement Project

Town Water Supply Subproject

1. Water Supply

SCREENING QUESTIONS	Yes	No	R
A. Project Siting Is the project area…			
▪ Densely populated?			
▪ Heavy with development activities?			
▪ Adjacent to or within any environmentally sensitive areas?			
• Cultural heritage site			
• Protected Area			
• Wetland			
• Mangrove			
• Estuarine			
• Buffer zone of protected area			
• Special area for protecting biodiversity			
• Bay			
B. Potential Environmental Impacts Will the Project cause…			
▪ Pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff?			
▪ Impairment of historical/cultural monuments/areas and loss/damage to these sites?			
▪ Hazard of land subsidence caused by excessive ground water pumping?			
▪ Social conflicts arising from displacement of communities?			
▪ Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?			
▪ Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?			
▪ Delivery of unsafe water to distribution system?			
▪ Inadequate protection of intake works or wells, leading to pollution of water supply?			
▪ Over pumping of ground water, leading to salinization and ground subsidence?			
▪ Excessive algal growth in storage reservoir?			
▪ Increase in production of sewage beyond capabilities of community facilities?			
▪ Inadequate disposal of sludge from water treatment plants?			
▪ Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?			
▪ Impairments associated with transmission lines and access roads?			
▪ Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.			
▪ Health and safety hazards to workers from the management of chlorine used for disinfection and other contaminants?			
▪ dislocation or involuntary resettlement of people			
▪ Social conflicts between construction workers from other areas and community workers?			
▪ Noise and dust from construction activities?			
▪ Increased road traffic due to interference of construction activities?			
▪ Continuing soil erosion/silt runoff from construction operations?			
▪ Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack			

of adequate monitoring of chlorine residuals in distribution systems?			
▪ Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?			
▪ accidental leakage of chlorine gas?			
▪ Excessive abstraction of water affecting downstream water users?			
▪ Competing uses of water?			
▪ increased sewage flow due to increased water supply			
▪ increased volume of silage (wastewater from cooking and washing) and sludge from wastewater treatment plant			
▪ Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ Social conflicts if workers from other regions or countries are hired?			
▪ 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 operation and construction?			
▪ Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			
Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	Yes	No	Remarks
▪ Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix 5A below)			
▪ Could changes in temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (e.g., changes in rainfall patterns disrupt reliability of water supply; sea level rise creates salinity intrusion into proposed water supply source)?			
▪ 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., by using water from a vulnerable source that is relied upon by many user groups, or encouraging settlement in earthquake zones)?			
▪ * Hazards are potentially damaging physical events.			

2. Sewerage & Sanitation

SCREENING QUESTIONS	Yes	No	REMARKS
B. Project Siting Is the project area…			
▪ Densely populated?			
▪ Heavy with development activities?			
▪ Adjacent to or within any environmentally sensitive areas?			
• Cultural heritage site			
• Protected Area			
• Wetland			
• Mangrove			
• Estuarine			
• Buffer zone of protected area			
• Special area for protecting biodiversity			
• Bay			
A. Potential Environmental Impacts Will the Project cause…			
▪ Impairment of historical/cultural monuments/areas and loss/damage to these sites?			
▪ Interference with other utilities and blocking of access to buildings; nuisance to neighboring areas due to noise, smell, and influx of insects, rodents, etc.?			
▪ dislocation or involuntary resettlement of people			
▪ Impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?			
▪ Overflows and flooding of neighboring properties with raw sewage?			
▪ Environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?			
▪ Noise and vibration due to blasting and other civil works?			
▪ Discharge of hazardous materials into sewers, resulting in damage to sewer system and danger to workers?			
▪ Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances, and protect facilities?			
▪ Social conflicts between construction workers from other areas and community workers?			
▪ Road blocking and temporary flooding due to land excavation during the rainy season?			
▪ Noise and dust from construction activities?			
▪ Traffic disturbances due to construction material transport and wastes?			
▪ Temporary silt runoff due to construction?			
▪ Hazards to public health due to overflow flooding, and groundwater pollution due to failure of sewerage system?			
▪ Deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water?			
▪ Contamination of surface and ground waters due to sludge disposal on land?			
▪ Health and safety hazards to workers from toxic gases and hazardous materials which may be contained in sewage flow and exposure to pathogens in sewage and sludge?			
▪ Large population increase during project construction and operation that causes increased burden on social infrastructure (such as sanitation system)?			
▪ Social conflicts between construction workers from other areas and community workers?			
▪ 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?			
▪ Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could			

result in injury to the community throughout project construction, operation and decommissioning?			
Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	Yes	No	Remarks
▪ Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix 5A below)			
▪ Could changes in temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (e.g., changes in rainfall patterns disrupt reliability of water supply; sea level rise creates salinity intrusion into proposed water supply source)?			
▪ 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., by using water from a vulnerable source that is relied upon by many user groups, or encouraging settlement in earthquake zones)?			

Environment	**Natural Hazards and Climate Change**	**Example Impact on Water Supply**
Arid/Semi-arid and desert environments	Low erratic rainfall of up to 500 mm rainfall per annum with periodic droughts and high rainfall variability. Low vegetative cover. Resilient ecosystems & complex pastoral and systems, but medium certainty that 10–20% of drylands degraded; 10-30% projected decrease in water availability in next 40 years; projected increase in drought duration and severity under climate change. Increased mobilization of sand dunes and other soils as vegetation cover declines; likely overall decrease in agricultural productivity, with rain-fed agriculture yield reduced by 30% or more by 2020. Earthquakes and other geophysical hazards may also occur in these environments.	Reduced availability of water due to reduced precipitation, increased temperatures, increased water demand and evaporation
Humid and sub-humid plains, foothills and hill country	More than 500 mm precipitation/yr. Resilient ecosystems & complex human pastoral and cropping systems. 10-30% projected decrease in water availability in next 40 years; projected increase in droughts, heatwaves and floods; increased erosion of loess-mantled landscapes by wind and water; increased gully erosion; landslides likely on steeper slopes. Likely overall decrease in agricultural productivity & compromised food production from variability, with rain-fed agriculture yield reduced by 30% or more by 2020. Increased incidence of forest and agriculture-based insect infestations. Earthquakes and other geophysical hazards may also occur in these environments.	Increased landslides and mudflows disrupt water supply networks, water seepage into storage tanks during floods, increased sedimentation and runoff reduce storage capacity and increase maintenance costs
River valleys/deltas and estuaries and other low-lying coastal areas	River basins, deltas and estuaries in low-lying areas are vulnerable to riverine floods, storm surges associated with tropical cyclones/typhoons and sea level rise; natural (and human-induced) subsidence resulting from sediment compaction and ground water extraction; liquefaction of soft sediments as result of earthquake ground shaking. Tsunami possible/likely on some coasts. Lowland agri-business and subsistence farming in these regions at significant risk.	Increased salinity of ground and surface water supplied caused in part by salt water intrusion, contamination of water supplies, physical damage to infrastructure caused by earthquakes
Small islands	Small islands generally have land areas of less than 10,000km2 in area, though Papua New Guinea and Timor with much larger land areas are commonly included in lists of small island developing states. Low-lying islands are especially vulnerable to storm surge, tsunami and sea-level rise and, frequently, coastal erosion, with coral reefs threatened by ocean warming in some areas. Sea level rise is likely to threaten the limited ground water resources. High	Same as above

Environment	Natural Hazards and Climate Change	Example Impact on Water Supply
	islands often experience high rainfall intensities, frequent landslides and tectonic environments in which landslides and earthquakes are not uncommon with (occasional) volcanic eruptions. Small islands may have low adaptive capacity and high adaptation costs relative to GDP.	
Mountain ecosystems	Accelerated glacial melting, rockfalls/landslides and glacial lake outburst floods, leading to increased debris flows, river bank erosion and floods and more extensive outwash plains and, possibly, more frequent wind erosion in intermontane valleys. Enhanced snow melt and fluctuating stream flows may produce seasonal floods and droughts. Melting of permafrost in some environments. Faunal and floral species migration. Earthquakes, landslides and other geophysical hazards may also occur in these environments.	Erratic water supply caused by glacial melting, loss of infrastructure investment resulting from rockfalls
Volcanic environments	Recently active volcanoes (erupted in last 10,000 years – see www.volcano.si.edu). Often fertile soils with intensive agriculture and landslides on steep slopes. Subject to earthquakes and volcanic eruptions including pyroclastic flows and mudflows/lahars and/or gas emissions and occasionally widespread ashfall.	Damage and loss of infrastructure, insecurity for local communities and settlements.

APPENDIX 8: OUTLINE CONTENTS OF INITIAL ENVIRONMENTAL EXAMINATION REPORT

1. Executive Summary

- Describe concisely the critical facts, significant findings, and recommended actions of environmental assessment study as documented in the report.3

2. Description of the Project

- Describe the proposed project; its major components, including any associated facility required by and for the project (for example, access roads, power lines, water supply, quarries and borrow pits, and spoil disposal).
- Include drawings and maps showing the project's layout and components, the project site, and the project's area of influence.

3. Policy, Legal, and Administrative Framework

- Discuss national and local legal and institutional framework within which the environmental assessment is carried out.
- Also identify project-relevant international environmental agreements to which the country is a party.

4. Description of the Environment (Baseline Data)

- Describes relevant physical, biological, and socioeconomic conditions within the study area.

5. Anticipated Environmental Impacts and Mitigation Measures

- Identify, predict and assesses the project's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic and impacts on livelihoods and physical cultural resources in the project's area of influence
- Examine alternatives to the proposed project site, technology, design and operation. Also state the basis for selecting the particular project design, location etc.
- Identify mitigation measures to avoid, reduce, mitigate, or compensate for adverse environmental impacts (in that order of priority)

6. Analysis of Alternatives

- Examine alternatives to the proposed project site, technology, design and operation – including the no project alternative – in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements.
- State the basis for selecting the particular project design proposed and, justifies recommended emission levels and approaches to pollution prevention and abatement.

7. Information Disclosure, Consultation, and Grievance Redress Mechanism

- Summarize the consultation and disclosure activities undertaken during project preparation
- Summarize comments and concerns received from affected person and other stakeholders and how these comments have been addressed in project
- Describes the planned information disclosure and consultation activities during the implementation.
- Describe the grievance redress framework – process, responsibilities and timelines.

8. Environmental Management Plan

- Summarize stage wise (design, construction and operation) environmental impacts and detail mitigation and management measures (Table 1)
- Describe monitoring measures (Table 2)
- Describe implementation arrangements and responsibilities for EMP implementation

Table A8.1: Summary Environmental Impacts & Mitigation Measures

Project stage	Potential Environmental Impacts	Proposed Mitigation Measures	Institutional Responsibility		Cost estimates
			Implementation	Monitoring	
Pre-construction phase					
Construction phase					
Operation & maintenance phase					

Table A8.2: Environmental Monitoring Plan

Project stage	**Mitigation measure**	**Parameters to be monitored**	**Location**	**Measurements**	**Frequency**	**Responsibilities**	**Cost**
Pre-construction phase							
Construction phase							
Operation & maintenance phase							

9. Conclusion and Recommendation

- Provide the conclusions drawn from the assessment and provide recommendations

APPENDIX 9: SAMPLE GRIEVANCE REGISTRATION FORM

(To be available in Hindi and English)

The _____Project welcomes complaints, suggestions, queries, and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.
Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date	**Place of registration**	**Project Town** **Project:**			
Contact information/personal details					
Name		**Gender**	* Male * Female	**Age**	
Home address					
Place					
Phone no.					
E-mail					
Complaint/suggestion/comment/question Please provide the details (who, what, where, and how) of your grievance below: If included as attachment/note/letter, please tick here:					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)	
Mode of communication: Note/letter E-mail Verbal/telephonic	
Reviewed by: (Names/positions of officials reviewing grievance)	
Action taken:	
Whether action taken disclosed:	Yes No
Means of disclosure:	

APPENDIX 10: PROCEEDINGS OF CITY LEVEL STAKEHOLDER CONSULTATION MEETING

Project Town_____ dated_____

A. Brief of the consultation meeting (date, venue, organizer, and participants)

B. Topics discussed during the meeting

C. Reports / Materials disclosed to the participants

D. Suggestions and feedback of participants and response of project team

Photographs:

List of Participants: (insert scanned image of the attendance sheet)

Madhya Pradesh Urban Services Improvement Project

Stakeholder Consultation Workshop

Program Town:_____ Date:_____Venue:_____

Organized by_____(ULB Name) & _____(PIU)

S. No	Name	Designation / Agency	Contact No.	Signature
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Use additional sheets if required

APPENDIX 11: GENERIC DESIGN-STAGE ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES OF WATER SUPPLY PROJECTS

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
1. Water Supply				
Water source	Source sustainability – lack of water availability	• Establish adequate water availability • Ensure that there are no water use-conflicts • In case of surface water source with multi-uses, ensure that necessary provision is made for respective town water supply through government statute as required before the start of detailed design. • For groundwater source, conduct hydrogeological study and establish source sustainability prior to detailed design	DC / CMC / PIU	PMC / PMU
Water Treatment Plant (WTP)	Water efficiency and pollution issues due to disposal of backwash water & sludge	• Provide recirculation system for backwash water • Provide sludge collection and treatment system (sludge drying beds) • Check the suitability of dried sludge to use as soil conditioner; if not suitable, dispose through landfilling	DC / DBO Contractor	PMC/PMU
Chlorination facility	Risk due to handling and application of chlorine	Design and develop chlorination facility with all safety features and equipment to meet with any accidental eventuality, which may include • Chlorine neutralization pit with a lime slurry feeder • Proper ventilation, lighting, entry and exit facilities • Personal protection and safety equipment for the operators in the chlorine plant • Provide training to the staff in safe handling and application of chlorine; • Provide standard operating manual for safe operation	DC / DBO Contractor	PMC/PMU
All components	Consents, permits, clearances, NOCs, etc. Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of work • Include all consent conditions in the designs & construction schedules	DC / DBO Contractor	PMC/PMU
All component	Operational impacts	• Develop operation & maintenance plan, including an environmental monitoring program	DC / DBO Contractor	PMC/PMU
All components	Loss of vegetation and tree cover	• Avoid tree cutting by suitable site planning • If tree-removal will be required, obtain tree-cutting permit and plant two native trees for every one that is removed.	DC / DBO Contractor	PMC/PMU
Pumping facilities	Energy efficiency	• Design pumping equipment with maximum efficiency to optimize the power consumption • Various combinations of number of pumps, stages, motor speed should be considered to select the best pump with ideal specific speeds. • Specific speeds of the pumps should be selected to achieve maximum efficiency of pumps. As per American Standard for DS Centrifugal Pumps issued by Hydraulic Institute, New Jersey, the specific speed for Pumps should	DC / DBO Contractor	PMC/PMU

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
		be in the range of 2000 to 3000 for attaining optimum efficiency. The pumps should be designed accordingly. • Attainable efficiency for procuring the pumps and motors should be considered as 88 to 92 percent for pumps and 94 percent for motors. It is proposed that during the procurement, the evaluation of bid shall also be in terms of efficiency. • The pumps shall conform to IS 1710 – 1989 Specification for Pump and IS 5120–1992 Technical Requirements for Roto-dynamic Special Purpose Pumps and tested to class 3 of IS: 9137-1978 Code for Acceptance Tests for Centrifugal, Mixed Flow and Axial Flow Pumps.		

APPENDIX 12: GENERIC DESIGN-STAGE ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES OF SEWERAGE AND SANITATION PROJECTS

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
2. Sewerage				
Sewage Treatment Plant (STP)	Nuisance to local people due to bad odor from STP	• STP should be located at least 500 m from the habitation (future development of area shall be considered, and site shall be selected in areas with least development potential as far as possible) • Provide a green buffer zone of 20-30 m wide around the STP; this should be planted with trees in multi-rows. • This will act as a visual screen around the STP and will improve the aesthetic appearance.	CMC/DC	PIU / PMU
STP	Pollution of surface water, groundwater and land resources due to inadequate treatment Design and development of STP as per disposal standards set by MPPCB/ CPCB	• The STP should be designed for following treated water disposal standards: ✓ BOD of 30 mg/l ✓ Suspended solids level of 100 mg/l ✓ Faecal coliform less than 1000/100 ml • Provide regular monitoring system • As far as possible utilize treated for beneficial purposes (such as for irrigation)	DC / DBO Contractor	PMC / PMU
STP & sewerage system	Mixing of industrial effluent with sewage can affect the treatment efficiency	• No industrial wastewater shall be allowed to dispose into municipal sewers • No domestic wastewater from industrial units shall be allowed into municipal sewers • Ensure that there is no illegal discharge through manholes or inspection chambers • Conduct public awareness programs; in coordination with MPPCB, issue notice to all industries for compliance • Conduct regular wastewater quality monitoring (at inlet and at outlet of STP) to ensure that the treated effluent quality complies with the standards	CMC / DBO Contractor DBO Contractor	PMC / PMU CMC
Sewage pumping stations (SPS)	Odor and insect nuisance due to operation of SPS	• Establish SPS at least 50 m away from the nearest house/shop etc., • Provide green buffer zone around the facility – at least a 5m strip of land around the facility shall be planted with trees; this will also improve the aesthetic appearance of the facility • Provide backup power facilities for continuous and uninterrupted pumping of sewage; ensure that anaerobic conditions are not created in wet well through continues operation	DBO Contractor	PMC / PMU
Sewer network	Measures to minimize Impacts during construction and operation of sewer network	• Limit the sewer depth where possible. • Sewers shall be laid away from water supply lines and drains (at least 1 m, wherever possible); • In all cases, the sewer line should be laid deeper than the water pipeline (the difference between top of the sewer and bottom of water pipeline should be at	DBO Contractor	CMC / PIU

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
		least 300 mm) • In unavoidable, where sewers are to be laid close to storm water drains or canals or natural streams, appropriate pipe material shall be selected (stoneware pipes shall be avoided) • For shallower sewers, use small inspection chambers in lieu of manholes; • Design manhole covers to withstand anticipated loads & ensure that the covers can be readily replace if broken to minimize silt/garbage entry • Ensure sufficient hydraulic capacity to accommodate peak flows & adequate slope in gravity mains to prevent buildup of solids and hydrogen sulfide generation • Equip pumping stations with a backup power supply, such as a diesel generator, to ensure uninterrupted operation during power outages, and conduct regular maintenance to minimize service interruptions. Consider redundant pump capacity in critical areas		
Community toilets	Impacts due to lack of operation & maintenance impacts	• Provide water and power supply as part of the project • A memorandum of understanding (MoU) between the ULB and community shall be put in place during the design stage for O&M • Develop an operation and maintenance (O&M) system with community participation • As a minimum, the O&M plan should specify (i) cleaning procedures and frequency; (ii) responsible personnel, and (iii) maintenance and repairs schedule.	ULB / operator	CMC / PMU
All components	Consents, permits, clearances, NOCs, etc. Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of work • Include all consent conditions in the designs & construction schedules	PIU / DBO Contractor	PMC / PIU
All components	Loss of vegetation and tree cover	• Avoid tree cutting by suitable site planning • If tree-removal will be required, obtain tree-cutting permit and plant two native trees for every one that is removed.	PMC	CMC / PIU
Pumping facilities	Energy efficiency	• Design pumping equipment with maximum efficiency to optimize the power consumption • Various combinations of number of pumps, stages, motor speed should be considered to select the best pump with ideal specific speeds. • Specific speeds of the pumps should be selected to achieve maximum efficiency of pumps. As per American Standard for DS Centrifugal Pumps issued by Hydraulic Institute, New Jersey, the specific speed for Pumps should be in the range of 2000 to 3000 for attaining optimum efficiency. The pumps should be designed accordingly. • Attainable efficiency for procuring the pumps and motors should be considered	PMC	CMC

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
		as 88 to 92 percent for pumps and 94 percent for motors. It is proposed that during the procurement, the evaluation of bid shall also be in terms of efficiency. • The pumps shall conform to IS 1710 – 1989 Specification for Pump and IS 5120–1992 Technical Requirements for Roto-dynamic Special Purpose Pumps and tested to class 3 of IS: 9137-1978 Code for Acceptance Tests for Centrifugal, Mixed Flow and Axial Flow Pumps.		

APPENDIX 13: GENERIC CONSTRUCTION-STAGE ENVIRONMENTAL IMPACTS & MITIGATION MEASURES (APPLICABLE TO BOTH WATER SUPPLY AND SEWERAGE PROJECTS)

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
1. All Construction Works (water supply & sewerage projects)				
All components	Environment, health and safety issues during construction of civil works	• All the site staff – workers, supervisors, engineers from Contractor, CMC, PIU and ULB will be required to undergo training on EMP implementation, standard operating procedures (SOP) for construction works; occupational health and safety (OH&S), core labor laws, applicable environmental laws, etc., prior to start of construction work	DBO Contractor and CMC	PMC / PIU
All components	Health risks associated with AC pipes	• No AC pipes shall be included in the project; leave the existing AC pipes, if any, in-situ without disturbing • Obtain details from PHED on location of underground AC pipes • Locate the new pipe/sewer carefully to avoid encountering AC pipes		
All components	Construction work camps, stockpile areas, storage areas, and disposal areas (disruption to traffic flow and sensitive areas and receptors)	• Prioritize areas within or nearest possible vacant space in the subproject location • Construction work camps shall be located at least 200 m from residential areas • Do not consider residential areas for stockpiling the waste/surplus soil • Material stockpiles shall be protected by bunds during the monsoon to arrest the silt laden runoff into drains • Surplus soil from trench excavations (pipeline and sewers) shall be utilized for construction works as far as possible • Identify site for disposal of construction waste/soil	DBO Contractor	PMC / PIU
All components	Source of construction materials (Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution)	• Contractor should obtain material from existing mines approved/licensed by Mines and Geology Department/ Revenue Department. • Submit a monthly statement of construction material procured indicating material type, source and quantity.	DBO Contractor	PMC / PIU
All components	Air quality (dust and emissions from construction activity may degrade the air quality)	• Damp down exposed soil and any stockpile on site by spraying with water when necessary during dry weather; • Bring materials (aggregates, sand, etc. gravel) as and when required; • Use tarpaulins to cover sand and other loose material when transported by vehicles; • Clean wheels and undercarriage of vehicles prior to leaving construction site • Ensure valid Pollution Under Control (PUC) Certificates for all vehicles and equipment used in the construction activity	DBO Contractor	PMC / PIU
All components	Impacts on surface drainage and	• Avoid stockpiling of earth fill especially during the monsoon season	DBO	PMC / PIU

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
	water quality due to contaminated runoff from construction areas in monsoon	unless covered by tarpaulins or plastic sheets • Stockpiles shall be provided with temporary bunds • Prioritize re-use of excess spoils and materials in the construction works. If necessary, dispose spoils only at identified disposal sites • Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies • Place storage areas for fuels and lubricants away from any drainage leading to water bodies • Do not dispose debris and waste soils in or near water bodies/rivers	Contractor	
All components	Impacts due to waste soil	• Coordinate with ULB / PIU for beneficial uses of excess excavated soils or immediately dispose to designated areas	DBO Contractor	PMC / PIU
All components	Employment generation	• Employ at least 50% of the labor force from project area if manpower is available	DBO Contractor	PMC / PIU
All components	Occupational health & safety to workers	*Safety at Work Place* • Follow standard and safe procedures for all site activities; do not employ arbitrary procedures • All trenches deeper than 2 m shall be protected with wooden bracing • Ensure that qualified first-aid at all times and be easily accessible • Secure all installations from unauthorized intrusion and accident risks • Provide H and S orientation training to all workers including basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers, etc., • Prohibit / control public entry into work site • Ensure the visibility of workers; use high visibility vests where required • Ensure moving equipment is outfitted with audible back-up alarms; • Provide sign boards easily understood by workers, visitors • Disallow worker exposure to noise level (>85 dBA); use protection • Document of work-related accidents • Provide medical insurance coverage for workers • Provide supplies of potable drinking water at work sites • Provide clean eating areas where workers are not exposed to hazardous or noxious substances • Provide toilet facilities, separate for men and women	DBO Contractor	PMC / PIU

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
All components	Temporary worker/construction camps	• Avoid worker camps by sourcing workers locally • The contractor should establish and operate the temporary worker camps in compliance the applicable government standards. • Locate camps away from residential areas (1km); consult ULB/ PIU • Accommodation provided shall be appropriate with good construction material; prefabricated structures are preferable • Camp site should be adequately drained to avoid water accumulation • Provide proper water and sanitation facilities; potable water in adequate quantities; all water storage structures must be cleaned regularly and covered properly to avoid any contamination • Provide separate facilities for men and women; sanitary facilities shall be properly built and well maintained; toilet and bath facilities should be provided on basis of 1 per 15 or less persons • Recover used oil and lubricants and reuse or remove from the site • Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas	DBO Contractor	PMC / PIU
All components	Site clean-up restoration	• Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; • All excavated roads shall be reinstated to original condition. • All disrupted utilities restored • All affected structures rehabilitated/compensated • The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and be cleaned up. • All hardened surfaces within the construction camp area shall be ripped, all imported materials removed, and the area shall be top soiled and regrassed	DBO Contractor	PMC / PIU
2. Linear components – water supply pipeline and sewer lines				
All components located within urban area	High noisy construction activities may have adverse impacts on sensitive receptors and structures	• Plan activities such that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; • Construction work shall be limited to day light hours (6 AM to 6 PM) for all the works located within the town; for facilities outside the towns, timings may be relaxed with ULB permission, however no work should be conducted between 10 PM – 6 AM at any site. • Provide prior information to the local public about the work schedule; • Ensure that there are no old and sensitive buildings that may come under risk due to the use of pneumatic drills; if there is risk, conduct manual work • Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street	DBO Contractor	PMC / PIU

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
		barriers the sound impact to surrounding sensitive receptor; and • Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s		
All linear components	Disturbance/damage to existing utilities on the sites (Telephone lines, electric poles and wires, water lines etc.)	• Identify utilities and services likely to be affected by the construction works (especially linear works like laying of water pipes/sewers) • Coordinate with respective agencies and take necessary measures to minimize disruptions • Prepare a contingency plan to include actions to be done in case of unintentional interruption of services	DBO Contractor	PMC / PIU
All linear components	Hindrance to traffic movement	• Plan pipeline work in consultation with the traffic police; Prepare a Traffic Movement Plan for the construction work in busy/high traffic /narrow roads • Plan work such that trench excavation, pipe laying, and refilling including compacting, at a stretch is completed in a minimum possible time • Provide for immediate consolidation of backfilling material to desired compaction - this will allow immediate road restoration and therefore will minimize disturbance to the traffic movement • Do not close the road completely, ensure that work is conducted onto edge of the road; allow traffic to move on one line; In unavoidable circumstances of road closure, provide alternative routes, and ensure that public is informed about such traffic diversions • At all work sites public information/caution boards shall be provided – information shall inter-alia include: project name, cost and schedule; executing agency and contractor details; nature and schedule of work at that road/locality; traffic diversion details, if any; entry restriction information; competent official's name and contact for public complaints.	DBO Contractor	PMC / PIU
All linear components	Nuisance/disturbance to sensitive areas (schools, hospitals and religious places) due construction work in the proximity (within 250 m of such place)	• No material should be stocked in this area; material shall be brought to the site as and when required • Conduct work manually with small group of workers and less noise; minimize use of equipment and vehicles • No work should be conducted near the religious places during religious congregations • Material transport to the site should be arranged considering school timings; material should be in place before school starts • Notify concerned schools, hospitals etc., 1 week prior to the work; conduct a 30-m awareness program on nature of work, likely disturbances and risks and construction work, mitigation measures in place, entry restrictions and dos and don'ts • Implement all measures strictly - dust and noise control, public safety,	DBO Contractor	CMC / PIU

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
		traffic management, strictly at the sites		
All linear components	Impediment of access to houses and business	• Leave space for access between mounds of excavated soil • Provide wooden planks/footbridges for pedestrians and metal sheets for vehicles to allow access across trenches to premises where required • Consult affected person to inform them in advance when work will occur • Address livelihood issues, if any; implement the Resettlement Plan to address these issues • Provide sign/caution/warning boards at work site indicating work schedule and traffic information; prevent public entry into work sites through barricading and security • Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.	DBO Contractor	PMC / PIU
All linear components	Trench excavation in in narrow streets will pose high risk to children and elders in the locality	• Provide prior information to the local people about the work • Conduct awareness program on safety during the construction work • Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day • Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches	DBO Contract	PMC / PIU
All linear components and components located within densely populated areas	Community health & safety	• Plan material and waste routes to avoid times of peak-pedestrian activities • Liaise with ULB in identifying risk areas on route cards/maps • Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure • Provide road signs and flag persons to warn of dangerous conditions, in case of location near the road	Contractor	PMC / PIU

APPENDIX 14: GENERIC OPERATION-STAGE ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES OF WATER SUPPLY PROJECTS

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
1. Water Supply				
Water supply	Water wastage - through leaks, and overflows, low consumer awareness	• Develop and implement effective leak detection and rectification system • Conduct awareness programs in water conservation and cost of providing potable water supply • Ensure appropriate consumption-based water tariff system that encourage judicious water use at consumer end	DBO Contractor ULB	CMC PMU
	Environmental monitoring	• Conduct environmental monitoring as per the EMP	DBO Contract	CMC/PIU

APPENDIX 15: GENERIC OPERATION-STAGE ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES OF SEWERAGE AND SANITATION PROJECTS

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
1. Sewerage and Sanitation				
STP	Operation efficiency as per the design	• Develop operating manual with all standard operating procedures (SOPs) for operation and maintenance of the facility; this should include guidance on the follow up actions in case of process disruptions, inferior quality of treated water; etc. Necessary training (hands-on and class room / exposure visits) shall be provided to the ULB staff dealing with STP • Provide training to the staff to implementation SOP • Operate STP as per the SOP and monitor the treated water quality • Ensure continuous uninterrupted power supply; provide back-up facility (such as generator) and make sure that adequate fuel supplies • Ensure availability of spare parts and consumables • Conduct regular wastewater quality monitoring (at inlet and at outlet of STP) to ensure that the treated effluent quality complies with the standards	DBO Contractor	CMC
Sewerage system	Leakage, overflow, blockage of sewer lines may affect the sewer system, contaminate land, water and create public health issues	• Establish routine maintenance program, including: o Regular cleaning of grit chambers and sewer lines to remove grease, grit, and other debris that may lead to sewer backups. Cleaning should be conducted more frequently for problem areas. o Inspection of the condition of sanitary sewer structures and identifying areas that need repair or maintenance. Items to note may include cracked/deteriorating pipes; leaking joints or seals at manhole; frequent line blockages; lines that generally flow at or near capacity; and suspected infiltration or exfiltration; and o Monitoring of sewer flow to identify potential inflows and outflows • Conduct repairs prioritized based on the nature and severity of the problem. Immediate clearing of blockage or repair is warranted where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, or sewer line blockages); • Review previous sewer maintenance records to help identify “hot spots” or areas with frequent maintenance problems and locations of potential system failure, and conduct preventative maintenance, rehabilitation, or replacement of lines as needed; • When a spill, leak, and/or overflow occurs, keep sewage from entering the storm drain system by covering or blocking storm drain inlets or by containing and diverting the sewage away from open channels and	DBO Contractor	CMC

Applicable component	Anticipated Impact / issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
		other storm drain facilities (using sandbags, inflatable dams, etc.). Remove the sewage using vacuum equipment or use other measures to divert it back to the sanitary sewer system. • Ensure that appropriate equipment is available for maintenance		
Sewerage system	Occupational health & safety: for personnel cleaning underground sewers there is a risk due to oxygen deficiency and harmful gaseous emissions (hydrogen sulphide, carbon monoxide, methane, etc.);	• Provide necessary health & safety training to the staff sewer cleaning & maintenance; STP operation; sludge handling • Provide all necessary personnel protection equipment • For personnel cleaning underground sewers there is a risk due to oxygen deficiency and harmful gaseous emissions (hydrogen sulphide, carbon monoxide, methane, etc.); provide adequate equipment (including oxygen masks) for emergency use	DBO Contractor	CMC / PIU

APPENDIX 16: APPLICATION FORM FOR ARCHEOLOGICAL SURVEY OF INDIA

Form I
(See rule 5)

Application for grant of permission for undertaking repair / renovation in the prohibited area and construction / reconstruction / repair / renovation in the regulated area of protected monument or archaeological site and remains declared as of national importance under the Ancient Monuments and Archaeological Sites and Remains Act, 1958

1. Name of the applicant :

2. Address of the applicant :
   (a) Present
   (b) Permanent

3. Name of the owner(s) :
   (if the applicant is other than the owner)

4. Address of the owner(s) :
   (a) Present address
   (b) Permanent address

5. Whether the property is owned by individual or jointly
   (furnish documents)

6. Whether the property is owned by Government/Public Sector Undertaking/Private Sector Undertaking/Firm (if so, details to be furnished with complete address and phone numbers) :

7. Locality of the proposed construction :
   (with full details plot number, etc.)

8. Name of the nearest monument or site :
   (a) Locality :
   (b) Taluk :
   (c) District :
   (d) State :
   (Enclose area map showing the monument and the site of repair / renovation / construction / reconstruction)

9. Distance of the site of construction related activities from the protected boundary of the monument:

(a) Distance from the main monument:

PERMISSION

(b) Distance from the protected boundary wall of the monument:

10. Nature of the work proposed:
(Repair/renovation/construction/reconstruction, etc.)

11. Details of work proposed
(furnish complete details with drawings of building / structure)

(i) Number of storeys
(ii) Floor area (storey-wise)
(iii) Height (excluding mumty, parapet, water-storage tank, etc.)
(iv) Height (including mumty, parapet, water-storage tank, etc.)
(v) basement, if any proposed with details

(Enclose plan, section and elevation drawings of the existing building duly approved by the Building Plan Sanctioning Authority and proposed building plan with section and elevation in case of reconstruction. Enclose building plan, section and elevation of the proposed building in case of construction/reconstruction.)

12. Purpose of the proposed work :
(residential/commercial/institutional/public/community)

13 Approximate date of the commencement of the proposed works:

14 Approximate duration for completion of the proposed work:

15. Maximum height of the existing modern buildings in the close vicinity of -
(a) near the Monument:
(b) near the site of construction related activity:

16. Whether the monument is located within the limits of Municipal Corporation / Municipalities/ Nagar Panchayat / Village Panchayat

17. Does any Master Plan/zonal development plan/layout plan approved by concerned local authorities exists for the city / town / village:

18. Status of modern constructions in the vicinity of the monument and the proposed site of construction/reconstruction:

19. Open space/park/green area close to the protected monument / protected area:

20. Whether any road(s) exists between the monument and the site of construction/reconstruction:

21. Remarks/additional information, if any:

I .....declare that the above information is correct. I also undertake to observe the provisions of the Ancient Monuments and Archaeological Sites and Remains Act, 1958 as amended by the, the Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010 and the rules made there under.

Place:

Seal of firm (if any)

Date: Signature of the applicant

Note:

1. If the application is on the behalf of the organisation/firm, the signature should be of the head of that organisation/firm.
2. Enclose photographs showing the monument and the existing modern constructions.
3. Google Earth Images of the area under reference showing the monument and the site of construction related activities.
4. Enclose ownership documents duly attested by an authorized officer of the Government.
5. In case of repairs/renovation a report from a duly authorised/licenced architect to be submitted by the applicant.

APPENDIX 17: SAMPLE CONSTRUCTION SITE CHECKLIST FOR EMP MONITORING

Project Name: MPUSIP **Name of the Package:** **Contractor:**	**Yes (√) No (x)**
Monitoring Details: _____	
EHS supervisor appointed by contractor and available on site	
Construction site management plan (spoils, safety, material, schedule, equipment etc.,) prepared	
Traffic management plan prepared	
Dust is under control	
Excavated soil properly placed within minimum space	
Construction area is confined; no traffic/pedestrian entry observed	
Surplus soil/debris/waste is disposed without delay	
Construction material (sand/gravel/aggregate) brought to site as & when required only	
Tarpaulins used to cover sand & other loose material when transported by vehicles	
After unloading , wheels & undercarriage of vehicles cleaned prior to leaving the site	
No AC pipes disturbed/removed during excavation	
No chance finds encountered during excavation	
Work is planned in consultation with traffic police	
Work is not being conducted during heavy traffic	
Work at a stretch is completed within a day (excavation, pipe laying & backfilling)	
Pipe trenches are not kept open unduly	
Road is not completely closed; work is conducted on edge; at least one line is kept open	
Road is closed; alternative route provided & public is informed, information board provided	
Pedestrian access to houses is not blocked due to pipe laying	
Spaces left in between trenches for access	
Wooden planks/metal sheets provided across trench for pedestrian	
No public/unauthorized entry observed in work site	
Children safety measures (barricades, security) in place at work sites in residential areas	
Prior public information provided about the work, schedule and disturbances	
Caution/warning board provided on site	
Guards with red flag provided during work at busy roads	
Workers using appropriate PPE (boots, gloves, helmets, ear muffs etc.)	
Workers conducting or near heavy noise work is provided with ear muffs	
Contractor is following standard & safe construction practices	
Deep excavation is conducted with land slip/protection measures	
First aid facilities are available on site and workers informed	
Drinking water provided at the site	
Toilet facility provided at the site	
Separate toilet facility is provided for women workers	
Workers camps are maintained cleanly	
Adequate toilet & bath facilities provided	
Contractor employed local workers as far as possible	
Workers camp set up with the permission of PIU	
Adequate housing provided	
Sufficient water provided for drinking/washing/bath	
No noisy work is conducted in the nights	
Local people informed of noisy work	
No blasting activity conducted	
Pneumatic drills or other equipment creating vibration is not used near old/risky buildings	

APPENDIX 18: SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT TEMPLATE

This template must be included as an appendix in the IEE that will be prepared for the project. It can be adapted to the specific project as necessary.

I. INTRODUCTION

- Overall project description and objectives
- Environmental category as per ADB Safeguard Policy Statement, 2009
  Environmental category of each subproject as per national laws and regulations
- Project Safeguards Team

Name	Designation/Office	Email Address	Contact Number
1. PMU			
2. PIUs			
3. Consultants			

- Overall project and sub-project progress and status
- Description of subprojects (package-wise) and status of implementation (preliminary, detailed design, on-going construction, completed, and/or O&M stage)

Package Number	Components/List of Works	Status of Implementation (Preliminary Design/Detailed Design/On-going Construction/Completed/O&M)[1]	Contract Status (specify if under bidding or contract awarded)	If On-going Construction	
				%Physical Progress	Expected Completion Date

[1] If on-going construction, include %physical progress and expected date of completion

II. COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS2

Package No.	Subproject Name	Statutory Environmental Requirements[3]	Status of Compliance[4]	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish[5]

III. COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

IV. COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT PLAN (REFER TO EMP TABLES IN APPROVED IEE/S)

- Confirm if IEE/s require contractors to submit site-specific EMP/construction EMPs. If not, describe the methodology of monitoring each package under implementation.

Package-wise Implementation Status

Package Number	Components	Design Status (Preliminary Design Stage/Detailed Design Completed)	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP) approved by Project Director? (Yes/No)	Remarks
			Not yet due (detailed design not yet completed)	Submitted to ADB (Provide Date of Submission)	Disclosed on project website (Provide Link)	Final IEE provided to Contractor/s (Yes/No)		

- Identify the role/s of Safeguards Team including schedule of on-site verification of reports submitted by consultants and contractors.
- For each package, provide name/s and contact details of contractor/s' nodal person/s for environmental safeguards.

[2] All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as appendix all clearance obtained during the reporting period. If already reported, specify in the "remarks" column.
[3] Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)
[4] Specify if obtained, submitted and awaiting approval, application not yet submitted
[5] *Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.*

- Include as appendix all supporting documents including **signed** monthly environmental site inspection reports prepared by consultants and/or contractors.
- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below
- Provide the monitoring results as per the parameters outlined in the approved EMP (or site-specific EMP/construction EMP when applicable).
- In addition to the table on EMP implementation, the main text of the report should discuss in details the following items:

(i) **Grievance Redress Mechanism.** Provide information on establishment of grievance redress mechanism and capacity of grievance redress committee to address project-related issues/complaints. Include as appendix Notification of the GRM (town-wise if applicable).

(ii) **Complaints Received during the Reporting Period.** Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

- Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.
- Identify muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads.
- Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these were intact following heavy rain;
- Identify designated areas for concrete works, chemical storage, construction materials, and refueling. Attach photographs of each area.
- Confirm spill kits on site and site procedure for handling emergencies.
- Identify any chemical stored on site and provide information on storage condition. Attach photograph.
- Describe management of stockpiles (construction materials, excavated soils, spoils, etc.). Provide photographs.
- Describe management of solid and liquid wastes on-site (quantity generated, transport, storage and disposal). Provide photographs.
- Provide information on barricades, signages, and on-site boards. Provide photographs.
- Provide information on
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Summary of Environmental Monitoring Activities (for the Reporting Period)

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Note: Attach Laboratory Results and Sampling Map/Locations.

Overall Compliance with CEMP/ EMP

No.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

V. APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

- Brief description on the approach and methodology used for environmental monitoring of each sub-project

VI. MONITORING OF ENVIRONMENTAL IMPACTS ON PROJECT SURROUNDINGS(AMBIENT AIR, WATER QUALITY AND NOISE LEVELS)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Noise Quality Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Monitoring Results)	
			Day Time	Night Time

VII. SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.

APPENDIXES

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- Other

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name
Contract Number

NAME: _____ DATE: _____
TITLE: _____ DMA: _____
LOCATION: _____ GROUP: _____

WEATHER CONDITION:
_____

INITIAL SITE CONDITION: _____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory _____ Incident _____Resolved _____ Unresolved _____

INCIDENT:
Nature of incident:
_____

Intervention Steps:
_____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition Yes ☐ No ☐

Signature
_____

Sign off

_____ _____

Name **Name**
Position **Position**