Draft Environmental Assessment and Review Framework

June 2011

IND: Bihar Urban Development Investment Program

Prepared by the Urban Development and Housing Department for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 28 June 2011)

Currency Unit	=	Indian rupee/s (Re/Rs)
Rs1.00	=	$0.0222
$1.00	=	Rs44.9500

ABBREVIATIONS

ADB	—	Asian Development Bank
BOQ	—	Bill of quantity
BPLE	—	Bihar Public Land Encroachment Act
BSPCB	—	Bihar State Pollution Control Board,
BUIDCO	—	Bihar Urban Infrastructure development Corporation
C&P	—	Consultation and Participation
CBO	—	Community-based organization
CBD	—	Central Business District
CFE	—	Consent for Establishment
CFO	—	Consent for Operation
CGWB	—	Central Ground Water Board
CITES	—	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	—	Convention on Migratory Species of Wild Animals
CWR	—	Clear water reservoirs
DFO	—	Divisional Forest Officer
DSC	—	Design and Supervision Consultants
EAC	—	Expert Appraisal Committee
EARF	—	Environmental Assessment Resettlement Framework
EIA	—	Environmental Impact Assessment
EMP	—	Environmental Management Plan
EPA	—	Environmental Protection Agency
FAM	—	Facility Administration Memorandum
GRC	—	Grievance Redress Committee
IEE	—	Initial Environmental Examination
IUCN	—	International Union for Conservation of Nature and Natural Resources
JNNURM	—	Jawaharlal Nehru National Urban Renewal Mission
MFF	—	Multitranche financing facility
MLD	—	million liters per day
MOEF	—	National Ministry of Environment and Forests
NAAQS	—	National Ambient Air Quality Standards
NGO	—	Nongovernmental organization
NOC	—	No Objection Certificate
NRRP	—	National Resettlement and Rehabilitation Policy
NRW	—	Non-revenue water
O&M	—	Operation and maintenance
OHSA	—	Occupational Health and Safety Administration
OHSR	—	Overhead storage reservoirs
OMC	—	Operations and Maintenance Contractors
PHED	—	Public Health Engineering Department
PIU	—	Project Implementation Unit
PMU	—	Project Management Unit
ROW	—	Right of way
SEAC	—	State Environment Assessment Committee
SEIAA	—	State Environment Impact Assessment Authority

SPS	—	Safeguard Policy Statement
STP	—	Sewage treatment plant
TDS	—	Total dissolved solids
TOR	—	Terms of reference
UFW	—	Unaccounted for water
UIDSSMT	—	Urban Infrastructure Development Scheme for Small and Medium Towns
ULB	—	Urban local body
USEPA	—	United States Environmental Protection Agency
WTP	—	Water treatment plant

WEIGHTS AND MEASURES

lakh	–	100 thousand = 100,000
crore	–	100 lakhs = 10,000,000
$\mu g/m^3$	–	micrograms per cubic meter
km	–	kilometer
lpd	–	liters per day
m	–	meter
mg/l	–	milligrams per liter
mm	–	millimeter
ppm	–	parts per million

NOTE

In this report, "$" refers to US dollars.

CONTENTS

I. INTRODUCTION

1. The Bihar Urban Development Investment Program is expected to improve the urban environment and living conditions in targeted urban areas. It will (i) improve and expand urban infrastructure and services in urban areas including slums, and (ii) strengthen urban institutional, management, and the financing capacity of the institutions, including the urban local bodies (ULBs). The Project will be in four urban areas: Bhagalpur Town, Darbhanga Town, Gaya City, and Muzaffarpur Town. The improvement in urban infrastructure will include rehabilitation, improvement, and expansion of: (i) water supplies; and (ii) sewerage and sanitation (Appendix 1).

2. The Project will be implemented using a multi-tranche financing facility. Tranche 1 comprises the Bhagalpur Water Supply Subproject. Preliminary design has been developed for the Bhagalpur Water Supply Subproject, and on this basis, an environmental assessment report has been prepared.

3. While subprojects for future tranches aim to improve environmental conditions in urban areas, the proposed improvement of infrastructure may result in adverse impacts on the environment. While developing urban facilities, impacts during construction are expected to be more severe than impacts during operation, though for a short duration. Exceptions are facilities such as sewage treatment plants, which may also have adverse impacts during operation, if proper operation and maintenance is not undertaken. For future tranches, subprojects have to comply with all relevant environmental requirements of the Government of India, the State Government of Bihar, and the Safeguards Policy Statement, 2009 (SPS) of the Asian Development Bank. For this purposed, this Environmental Assessment and Review Framework (EARF) has been prepared. The EARF also applies to changes in subprojects particularly during detailed design.

II. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

A. Applicable Legislations

4. The implementation of the subprojects will be governed by the government and State of Bihar environmental acts, rules, regulations, and standards. These regulations impose restrictions on the activities to minimize or mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure subprojects are consistent with the legal framework, whether national, state or municipal or local. In addition, subprojects shall also be consistent with ADB SPS.

5. The following legislations are applicable to the Project:

(i) Environmental (Protection) Act of 1986 as amended in 1991;
(ii) Environmental (Protection) Rules of 1986 and amendments;
(iii) Environmental Impact Assessment Notification of 2006;
(iv) Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments;
(v) Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments;
(vi) Noise Pollution (Regulation and Control) Rules of 2000;
(vii) Wildlife (Protection) Act of 1972, Rules of 1995 and amendments;
(viii) Indian Forest Act of 1927;
(ix) Forest (Conservation) Act of 1980, Rules of 1981 and amendments;

(x) Guidelines for Diversion of Forest Lands for Non-Forest Purpose under the Forest (Conservation) Act of 1980;
(xi) Central Pollution Control Board (CPCB) Environmental Standards;
(xii) Ancient Monuments and Archaeological Sites and Remains Rules of 1959; and
(xiii) Land Acquisition Act of 1894 as amended in 1985.

6. Any component included in the Project shall comply with the above government and State of Bihar environmental laws, standards, rules and requirements. Key standards include those related to drinking water quality, air quality, effluent discharge, and protected areas. Compliance is required in all stages of the project including design, construction, and operation and maintenance.

B. Environmental Assessment Requirements

7. The government's Environmental Impact Assessment (EIA) Notification of 2006, which replaces the EIA Notification of 1994, requires environmental clearance for certain defined activities/projects.[1] This Notification classifies the projects or activities that require environmental clearance into 'A' and 'B' categories depending on the impact potential and/or scale of project. For both category projects, prior environmental clearance is mandatory before any construction work, or preparation of land except for securing the land, is started. Clearance provisions are as follows:

(i) Category 'A' projects requires prior environmental clearance from the Ministry of Environment and Forest (MoEF);[2]
(ii) Category 'B' projects require prior environmental clearance from the State Environmental Impact Assessment Authority (SEIAA).[3]

8. This Notification provides that, any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 10 km from the boundary of: (i) protected areas notified under the Wild Life (Protection) Act, 1972, (ii) critically polluted areas as notified by the CPCB from time to time, (iii) notified eco-sensitive areas, (iv) inter-state boundaries and international boundaries. Also, in the case where a SEIAA does not exist, Category B project will be reviewed by the MoEF and reclassified as Category A.

9. Consequently, the proposed water supply and sewerage and sanitation subprojects are not listed in the EIA Notification of 2006 "Schedule of Projects Requiring Prior Environmental Clearance". Thus environmental clearances for the subprojects are not required.

C. National Legal Requirements

10. **Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments.** Any component of the Project having potential to generate sewage or trade effluent will come under the purview of the Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments. Such projects have to obtain Consent for Establishment

[1] EIA Notification of 2006 "Schedule of Projects Requiring Prior Environmental Clearance"
[2] Category A projects - based on preliminary details provided by the project proponent, the MoEF Expert Appraisal Committee (EAC) will determine comprehensive terms of reference (TOR) for the EIA studies. This TOR will be finalized within 60 days. On the recommendation of the EAC based on EIA studies, MoEF provides the environmental clearance.
[3] Category B projects – to be further divided by State Level Expert Appraisal Committee (SEAC) into B1 (require EIA studies) and B2 (do not require EIA studies). The SEAC will determine TOR for EIA studies for B1 projects within 60 days. On the recommendation of the SEAC based on EIA studies, SEIAA provides the environmental clearance.

(CFE) under Section 25 of the Act from State Pollution Control Board (SPCB) before starting implementation and Consent to Operate (CTO) before commissioning. The Water Act also requires the occupier of such subprojects to take measures for abating the possible pollution of receiving water bodies. The application is attached as **Appendix 2**. The following subprojects require CFE and CFO from SPCB:

(i) New or augmentation of water treatment plants;
(ii) New or augmentation of sewage treatment plants.

11. **Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.** The subprojects having potential to emit air pollutants into the atmosphere have to obtain CFE under Section 21 of the Air (Prevention and Control of Pollution) Act of 1981 from SPCB before starting implementation and CTO before commissioning the project. The occupier of the project or facility has the responsibility to adopt necessary air pollution control measures for abating air pollution. The application form is attached as also shown in **Appendix 2**. The following require CFE and CFO from SPCB:

(i) Diesel generators; and
(ii) Hot mix plants, wet mix plants, stone crushers etc, if installed for construction.

12. Emissions and discharges shall comply with standards notified by the CPCB. **Appendix 3** provides applicable standards for effluents, receiving waterbodies, air quality, water quality and noise levels.

13. **Forest Legislations.** The government's forest legislation dates back to enactment of the Indian Forest Act of 1927. This Act empowers State of Bihar to declare "any forest land or waste-land, which is the property of government or over which the government has proprietary rights or to the whole or any part of the forest-produced of which the government is entitled", a reserved forest or protected forest. State of Bihar may assign to any village-community the rights of the government over a reserved forest - those are called village-forests. The Act also allows government control over forest and lands not being the property of the government.

14. For reserved forests and village-forests, activities like clearing or breaking up of any land for cultivation or for any other purpose, damage to vegetation/trees and quarrying or removing any forest produce are prohibited. For protected forests, with the provision of the Act, State of Bihar makes rules to regulate activities like cutting of trees and removal of forest produce; clearing or breaking up of land for cultivation or any other purpose; and for protection and management of any portion of protected forest.

15. The government's Forest (Conservation) Act of 1980 (amended in 1988) restricts the deforestation of forests for use of non-forest purposes. According to the Act, State of Bihar requires prior approval of MoEF for the use of forest land for non-forest purposes (means the breaking up or clearing of any forest land) or for assigning lease to any private person or agency not controlled by government. The Forest (Conservation) Rules of 2003 issued under this Act, provide specific procedures to be followed for conversion of forest land for non-forest purposes.

16. For the Project, notably water supply subprojects may require acquisition of forest lands for water treatment plants or service reservoirs. The water supply transmission mains may also traverse forest lands. The forest land conversion will follow the "Guidelines for Diversion of Forest Lands for Non-Forest Purpose" under Forest (Conservation) Act, 1980. Compensatory afforestation is one of the most important conditions stipulated for diversion of forest land. The following proposals for conversion will be forwarded by State of Bihar to MoEF:

(i) Forest land involving up to 5 hectares (ha) will cleared by the Regional Office of the MoEF;
(ii) Forest land involving more than 5 ha and up to 20 ha will be cleared by the Regional Office after referring the case to MoEF;
(iii) Conversion of forest land (a) having density above 0.4 irrespective of the area involved, and (b) of more than 20 ha in the plains and 10 ha in the hilly region, irrespective of density, will be cleared by MoEF;
(iv) Compensatory afforestation is compulsory for conversion;
(v) Afforestation will be done over an equivalent area of non-forest land;
(vi) As far as possible, the non-forest land for compensatory afforestation shall 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; and
(vii) Where non-forest lands are not available, compensatory afforestation may be carried out over degraded forest twice in extent to the area being diverted.

17. Conversion of forest lands that are part of National Parks or Sanctuaries and Tiger Reserve areas (notified under Indian Wildlife [Protection] Act of 1972) is not permitted. In exceptional case, State of Bihar requires consent of the Indian Board of Wildlife for obtaining approval of the State Legislature for de-notification of the area as a sanctuary. The State or National Wildlife Board under MoEF is the authority which will grant a "No Objection Certificate" (NOC) for any construction within a sensitive area. Every user agency, who proposes to use any forest land for non-forest purposes and use buffer zone of the wildlife protected areas for other purposes must apply for forest and/or wildlife clearance using the application form attached as **Appendix 4**. The flow chart of forest and/or wildlife clearance process is shown in **Appendix 5**.

18. Cutting of trees in non-forest land, irrespective of land ownership, also requires permission from the State Forest and Environment Department. Afforestation to the extent of two trees per each tree felled is mandatory.

19. The Tranche 1 subproject, Bhagalpur Water Supply's intake is proposed to be located within the Vikramshila Gangetic Dolphin Sanctuary (VGDS), hence clearance from MoEF is required prior to subproject implementation. It is not anticipated that other subprojects will be within sensitive areas, and subproject selection criteria specifies avoidance of sensitive areas.

20. **Ancient Monuments and Archaeological Sites and Remains Rules, of 1959.** The Rules designate areas within a radius of 100 meters (m) and 300 m from the "protected property" a**s** "protected area" and "controlled area" respectively. No development activity (including mining operations and construction) is permitted in the "protected area" and all development activities likely to damage the protected property are not permitted in the "controlled area" without prior permission of the Archaeological Survey of India (ASI). Protected property includes the site, remains, and monuments protected by ASI or the State Department of Archaeology.

21. For the Project, subproject activities within Archaeologically Protected Areas will be avoided. If activities are to be done in the controlled area of protected properties, then the executing and implementing agencies and the line department will take the necessary NOCs from ASI.

22. **Land Acquisition Act of 1894 (amended in 1985).** Private land acquisition is guided by the provisions and procedures in this Act. The District Collector or any other officer designated

will function as the Land Acquisition Officer on behalf of the Government. There is a provision for consent award to reduce the time for processing if the land owners are willing to agree on the price fixed by the Land Acquisition Officer. The option of acquiring lands through private negotiations is also available.

23. For the Project, land acquisition shall comply with all national and state laws and regulations including this Act. It will also comply with ADB SPS and for that reason, a Resettlement Framework has been developed for the Project. For Bhagalpur Water Supply Subproject considered in Tranche 1, no permanent land acquisition is required and involuntary resettlement impacts are temporary and minimal. A resettlement plan has been prepared to address these temporary impacts.

D. State Laws and Regulations

24. **Bihar Municipal Act of 2007.** Pursuant to the 74th (Constitution Amendment) Act, 1992, the Government enacted the Bihar Municipal Act in 2007. The Act is comprehensive and covers three levels of ULBs, namely Nagar Panchayat, the Municipality, and the Corporation. The following are the salient features of the Act that defines and regulates all civic services, amenities and facilities within the domain of the ULB.

Table 1: Salient Features of the Bihar Municipal Act Relevant to the Project

Subproject	Details
Water Supply	(i) **Water supply to the municipal area:** Municipality either itself or through any agency (including a government department) shall supply water for the use of its inhabitants. (ii) **Vesting of public work:** All public tanks, reservoirs, cistern, well, tube wells, aqueducts, conduits, tunnels, pipes, tapes and other water works that are either made or laid or created from Municipal funds shall be vested with Municipality. (iii) **Right of underground water:** All rights over the sub-soil water resources within the municipal area shall be vested with the Municipality. (iv) **Construction of water works:** Within the municipal area, the Municipality, and if necessary in collaboration with or through other local bodies or agencies, will undertake construction of water works and operate, manage or maintain any water works intended to serve the inhabitants of the municipal area. (v) The Municipality may, in exceptional circumstances, either on its or through other agency, provide, free of cost, supply water to the public within the municipal area and may for the said purpose, construct public hydrants or stand posts or other conveniences. (vi) No building, private street, digging of well, tube well, pond and cistern or fountain will be constructed without any written permission from the Municipality.
Drainage and Sewerage	(i) The Act directs the Municipality to provide and maintain drainage and sewerage system with safe and sufficient outfall in or outside the municipal area. (ii) No owner or occupier shall entitle to cause his drain water to empty into the municipal drains until and unless he receives written permission from the Municipality. (iii) No person shall encroach upon drainage and sewerage systems in the municipal area. Municipality may give consent for the purpose of securing access to any abutting land or building.

25. For the Project, it is necessary to screen subprojects during design stage against the provisions of the Municipal Act. Proper dialogue with respective project town ULBs will be helpful for safeguarding any issues which may arise during implementation and operation of subprojects.

26. **The Bihar Forest (Amended) Act of 1990 and Bihar Public Land Encroachment Act of 1956 (BPLE).** These provide that encroachment of forest land is a cognizable and non-bailable offence. If any Forest Officer, not below the rank of the Divisional Forest Officer (DFO), has reasons to believe that forest land has been encroached, the Officer can evict the

encroachers and can use all power conferred on a Magistrate under the BPLE. The Indian Forest Act of 1927 provides realization of royalty and compensation for damages of forest produce and forest land from the encroachers.

27. There is no anticipated encroachment of forest land in Tranche 1. In case of any encroachment of subprojects within the designated forest in future tranches, permission or NOC is required from Bihar DFO and MoEF.

28. **Bihar Land Acquisition, Resettlement and Rehabilitation Policy of 2007.** The Policy addresses the issues of fair compensation and assistance/facilities to be provided to affected families.

29. For the Project, land acquisition shall comply with all national and state laws and regulations including this Policy. It will also comply with ADB SPS and for that reason, a Resettlement Framework has been developed for the Project. For Bhagalpur Water Supply Subproject, no permanent land acquisition is required and involuntary resettlement impacts are temporary and minimal. A resettlement plan has been prepared to address these temporary impacts.

E. Applicable International Environmental Agreements

30. In addition to national and state rules and regulations, international conventions such as the International Union for Conservation of Nature and Natural Resources (IUCN), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention on Migratory Species of Wild Animals (CMS) and Ramsar Convention on Wetlands of International Importance are applicable for selection and screening of subprojects under restricted/sensitive areas. India is a party to these conventions.

31. **International Union for Conservation of Nature and Natural Resources (IUCN).** The IUCN Red List of Threatened Species (also known as the IUCN Red List or Red Data List), founded in 1963, is a comprehensive inventory of the global conservation status of plant and animal species. The IUCN is an authority on the conservation status of species. A series of Regional Red Lists are produced by countries or organizations, which assess the risk of extinction to species within a political management unit. The IUCN Red List is set upon precise criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. The aim is to convey the urgency of conservation issues to the public and policy makers, as well as help the international community to try to reduce species extinction.

32. **Convention on Migratory Species of Wild Animals (CMS).** CMS was adopted in 1979 and entered into force on 1 November 1983. CMS, also known as the Bonn Convention, recognizes that states must be the protectors of migratory species that live within or pass through their national jurisdictions, and aims to conserve terrestrial, marine and avian migratory species throughout their ranges. Migratory species threatened with extinction are listed on Appendix I of the Convention. CMS Parties strive towards strictly protecting these species, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. Migratory species that need or would significantly benefit from international cooperation are listed in Appendix II, and CMS encourages the Range States to conclude global or regional agreements.

33. **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).** It is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. CITES were first formed, in the 1960s. Annually, international wildlife trade is estimated to be worth billions of dollars and to include hundreds of millions of plant and animal specimens. The trade is diverse, ranging from live animals and plants to a vast array of wildlife products derived from them, including food products, exotic leather goods, wooden musical instruments, timber, tourist curios and medicines. Levels of exploitation of some animal and plant species are high and the trade in them, together with other factors, such as habitat loss, is capable of heavily depleting their populations and even bringing some species close to extinction. Many wildlife species in trade are not endangered, but the existence of an agreement to ensure the sustainability of the trade is important in order to safeguard these resources for the future. Because the trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international cooperation to safeguard certain species from over-exploitation.

34. **Ramsar Convention on Wetlands of International Importance 1971.** The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Ramsar Convention is an international treaty for the conservation and sustainable utilization of wetlands The Ramsar Convention is the only global environmental treaty that deals with a particular ecosystem. According to the Ramsar list of Wetlands of International Importance, there are 25 designated wetlands in India which are required to be protected. Activities undertaken in the proximity of Ramsar wetlands shall follow the guidelines of the convention.

35. The application of the international conventions above based on proposed subprojects are as follows:

36. Tranche 1's Bhagalpur Water Supply Subproject sources water from the River Ganges. The location is within the designated Vikramshila Gangetic River Dolphin Sanctuary. The Ganges Dolphin, *platanista gangetica gangetica* is included in (i) Schedule I of the Indian Wildlife (Protection) Act 1972, (ii) Appendix I of CITES, (iii) Appendix II of the CMS and (iv) categorized as "endangered" on the IUCN Red List. Protection is required and it is necessary to study the conservation management plan for the protected area of the endangered species and develop mitigation measures/protection strategy against the specific impact during construction and operation of the water supply system particularly for source development.

37. In subsequent tranches if any floral and faunal habitation, listed under IUCN, CMS or CITES are reported within the subproject influence area then the responsibility of executing and implementing agencies to study the conservation plan of those species. Conservation of biodiversity is to be planned based on the international conventions.

38. There are no Ramsar designated wetlands reported within the subproject areas. Hence restriction of project activity within Ramsar site is not applicable.

39. A summary of Government and State environmental compliance requirements applicable to the Project is presented in **Table 2**.

Table 2: Action Required Ensuring Subprojects Comply with National Environmental Laws

Component	Applicable Legislation	Compliance	Action Required
1. All components that require acquisition of forest land or are in wildlife conservation areas.	Forest (Conservation) Act 1980; Wildlife (protection) Act 1972	Approval from MoEF	Identify non-forest land and formulate an afforestation program or clearance from MoEF as per standard procedure. Clearance from National Wildlife Board of MoEF as per standard procedure.
2. Water Treatment Plant (WTP) and Sewage Treatment Plant (STP)	Water (Prevention and Control of Pollution) Act 1974	NOC, CFE and CFO from BSPCB	Based on project review and site inspection BSPCB provides CFE before construction, and stipulate the disposal standards to be met during operation. After completion of construction, CFO is issued confirming compliance with the CFE conditions, if any.
		Renewal of CFO during operation of STP and WTP	Based on the performance of the STP, WTP and its compliance with the disposal standards. CFO is renewed every year.
3. Mobile diesel generators, hot mix plant and stone crusher	Air (Prevention and Control of Pollution) Act 1981	CFE and CFO from BSPCB	CFO renewal every year based on performance.

BSPCB – Bihar State Pollution Control Board; CFE – Consent for Establishment; CFO – Consent for Operation; MoEF – Ministry of Environment and Forest; STP – sewage treatment plant; WTP – water treatment plant

III. OVERVIEW OF THE SUBPROJECT COMPONENTS AND ANTICIPATED ENVIRONMENTAL IMPACTS

A. Urban Infrastructure and Services Improvement Components

40. Preliminary design for the Tranche 1 urban infrastructure and services improvement subproject has been completed. The Tranche 1 subproject environmental assessment has also been undertaken.

41. Preliminary lists of subprojects have been identified for subsequent tranches. These include: (i) Bhgalpur water supply and new intake and new WTP; (ii) Muzaffarpur sewerage and sanitation (construction of STP and pumping stations; laying of primary/trunk sewer; and laying of secondary and tertiary sewer); (iii) Darbhanga water supply (construction of intake structure; pump house; WTP; laying of transmission/rising mains; and distribution networking); and (iv) Gaya water supply (construction of intake structures, pump house, and WTP; and laying of transmission/rising main and distribution network). Stand by subprojects are (i) Darbhanga sewerage and sanitation and (ii) Gaya sewerage and sanitation. Summary descriptions of project components are shown in **Appendix 6.**

B. Project Management, Financial Management, Institutional Development, Capacity Building and Training Components

42. The Project will fund costs of Bihar Urban Infrastructure Development Finance Corporation (BUIDCO), and cost of consultants to provide assistance in project management and related capacity building. Existing and newly created ULBs will be strengthened so that water supply, sewerage, and sanitation facilities can be operated in a much more effective and efficient manner, own source funding of all urban services is substantially enhanced, and urban

land management is improved. Support will be provided by the Project for capacity strengthening.[4]

C. Anticipated Environmental Impacts

43. Project management, financial management, institutional development, capacity building and training components are not expected to result in environmental impacts. However, subprojects undertaken under this component will be subjected to the EARF. For subprojects under the urban infrastructure and services improvement component, environmental impacts during design, pre-construction, construction, and operation will be reviewed and assessed. During subproject construction and implementation, impacts on the physical environment such as water, air, soil, noise; and on the biological environment, like flora and fauna and socio-economic environment will be considered. For urban infrastructure and service improvement subprojects it is anticipated that impacts will be temporary and of short duration. In such cases, mitigation measures i.e. control of air, dust pollution, checking of water and noise pollution, protection of biological environment can address impacts. Other measures such as traffic management during laying of pipes shall also be considered. Safety measures, both occupational and social are will be considered and impacts and mitigation measures will be elaborated in environmental assessment reports (Environmental Impact Assessment Report [EIA] or Initial Environmental Examination [IEE]).

44. Anticipated environmental impacts for the Tranche 1 subproject are provided in the environmental assessment report. For subprojects in future tranches, generic impacts during design, construction and operation are identified in **Table 3.** Specific impacts for water supply, and sewerage and sanitation sectors are in **Appendix 5**.

Table 3: Possible Environmental Impact Due to Project Implementation

Impact Field	Impact to Environment
Design Phase	
Environmental clearances	CFE and CFO are required from the BSPCB in order to implement the project. Land allotment letter required. If not pursued on timely basis, this can delay the Project.
Utilities	Telephone lines, electric poles and wires, water pipe (old) existing within right-of-way (ROW) may be damaged.
Water supply	Health risk due to closure of water supply.
Asbestos cement pipes	Risk of contact with carcinogenic materials.
Social and cultural resources	Ground disturbance can uncover and damage archaeological and historical remains. Impact on sites of cultural/religious importance during pipe laying.
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas	Disruption to traffic flow and sensitive receptors.
Land for STP/WTP	Land use impact, conversion of present land use to proposed one
Construction Phase	
Sources of materials	Extraction of materials can disrupt natural land contours and vegetation

[4] The proposed project management including financial management and capacity development for each town include: (i) safeguards compliance studies; (ii) community awareness programs, (iii) compost marketing studies; (iv) non-revenue reduction programs, power and water audits; (v) support for migration to a double entry accounting basis system in ULB; (vi) improvement in financial accountability of urban service; (vii) improvement in user charge collection efficiency; (viii) streamlining of service specific expenditures; (ix) mobilization of service specific revenues; (x) support for preparation of a geographic information system (GIS) based property tax system; (xi) private sector participation opportunities studies; and (xii) water utility reform program focusing on asset management improvement.

Impact Field	Impact to Environment
	resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.
Air quality	Emissions from construction vehicles, equipment, and machinery used for excavation and construction resulting to dust and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons.
Surface water quality	Mobilization of settled silt materials, run-off from stockpiled materials, and chemical contamination from fuels and lubricants during construction works can contaminate downstream surface water quality.
Noise levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people.
Waste water (i.e. extracted ground water during re-development work for tube well)	Improper disposal of waste water causing water pollution.
Generated muck	Improper disposal of muck causing environmental pollution.
Ecological resources	Felling of the trees–affect terrestrial ecological balance and affect terrestrial and aquatic fauna/wildlife.
Existing infrastructure and facilities	Disruption of service and damage to existing infrastructure located alongside roads, in particular water supply pipes.
Landscape and aesthetics	Solid wastes as well as excess construction materials create unacceptable aesthetic condition.
Accessibility	Traffic problems and conflicts in ROW. Roads/people may be disturbed by repeated trenching.
Socio-economic–Income	Impede the access of residents and customers to nearby shops.
Socio-economic–Employment	Generation of contractual employment and increase in local revenue.
Occupational health and safety	Occupational hazards which can arise during project implementation.
Construction waste	Trenching will produce additional amounts of waste soil.
Asbestos cement pipes	Health risk in case of their presence within ROW.
Community health and safety	Traffic accidents and vehicle collision with pedestrians during material and waste transportation.
Work camps	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants.
Social and cultural resources	Risk of archaeological chance finds. Sites of social/cultural importance (schools, hospitals, religious place, tourism sites) may be disturbed by noise, dust, vibration and impeded access. Trenching on concrete roads using pneumatic drills will cause noise and air pollution.
Clean-up operations, restoration and rehabilitation	Impacts on social or sensitive receptors when post construction requirements are not undertaken, e.g. proper closure of camp, disposal of solid waste, and restoration of land after subproject construction.
Operation Phase	
Occupational health and safety	Adverse impacts on the appearance of surrounding environment and exposure of workers to hazardous debris
Waste water quality	Deterioration of surface and groundwater quality
Solid wastes–sludge	Environmental pollution–potential impact on soil, groundwater, and surface water nearby the disposal site
Hazardous chemicals	Release to nature from treatment plant causing air, water, and soil pollution
Air emissions	Air pollution from gaseous or volatile chemicals used for disinfection processes
General maintenance	May cause disturbance to sensitive receptors, dusts, increase in noise level Leaking sewers can damage human health and contaminate soil and groundwater
Economic development	Impediments to residents and businesses
Social and cultural resources	Temporary disruption of activities
Ecological resources	Affect on aquatic biodiversity and terrestrial flora and fauna
Land use pattern	Areas will be developed (conversion of agriculture/forest land to residential and commercial land) with better infrastructure facility like improved water supply, and sewerage and sanitation

BSPCB – Bihar State Pollution Control Board; CFE – Consent for Establishment; CFO – Consent for Operation; ROW – right of way; STP - sewage treatment plant; WTP - water treatment plant.

IV. ENVIRONMENTAL ASSESSMENT FOR SUBPROJECTS AND COMPONENTS

A. Environmental Guidelines for Subproject Selection

45. No subprojects in future tranches are anticipated to have significant negative impacts with subprojects primarily designed to improve existing urban environmental conditions. Guidelines for subproject selection in **Table 4** provide further guidance to avoid or minimize adverse impacts during the identification and finalization of subprojects.

Table 4: Environmental Criteria for Sub-project Selection

	Components	Environmental Selection Guidelines	Remarks
1	**Overall Selection Guideline (applicable to all components)**	Comply with all requirements of relevant national and state requirements	see Section II of this EARF
		Site selection process will avoid involuntary resettlement and impacts on vulnerable persons including indigenous peoples If unavoidable the extent of impacts will be minimized.	see Resettlement Framework (RF) and Indigenous Peoples Framework (IPF).
		Site selection will not result in destruction and avoid being sited in protected areas, including notified reserved forests or biodiversity conservation hotspots (sanctuary/national park etc.)	Approval (NOC) from concerned authority if absolutely necessary
		Sub-project location shall not result in destruction/disturbance to historical and cultural places/values	
		There shall be no social conflicts for site selection	
		It will reflect inputs from public consultation and disclosure for site selection	
		If work is proposed with the aim of improving conservation or management of designated sites this must be undertaken: (i) after a comprehensive study and development of management plans and criteria; and (ii) with the direct involvement and approval of national and local bodies responsible for the site	
2	**Water Supply**	Comply with all requirements of relevant national and state law, including the Water (Prevention and Control of Pollution) Act 1974	see Section II of this EARF
		Avoid environmentally sensitive locations including sites with national or international designation (e.g. for ecological/biological conservation i.e. reserved and protected forest, historical or cultural importance sites, etc.)	
		Site selection will not result in excessive abstraction of water affecting downstream water uses and other beneficial water uses for surface and ground water Utilize water sources at sustainable levels of abstraction only (i.e. without significant reductions in the quantity or quality of the source overall)	For this water availability data/water reserve status of the subproject area is required
		Not to utilize raw water of very poor quality evidenced by presence of high levels of pathogens/mineral contents	
		Avoid using water sources that may be polluted by upstream users	In case of planning of water withdrawal from river/stream, If any polluting sources like sewage

	Components	Environmental Selection Guidelines	Remarks
			channel, thermal power plant discharge or other industrial discharge in upstream nearby the intake site that source shall be avoided Review of surface water quality data of intake point is necessary for designing and environmental assessment
		Avoid water-use conflicts by not abstracting water that is used for other purposes (e.g. irrigation)	
		Locate all new facilities (WTP, tube wells, pumping stations) at least 100 m from houses, shops or any other premises used by people, thus establishing a buffer zone to reduce the effects of noise, dust and the visual appearance of the site	Distance restriction may be reviewed depending on the technology adopted, land availability and buffer zone planning
		Ensure location of water treatment plant will take into account the present and future demands, direction and rate of growth of the service area and potential deterioration of source quality in the future	
		Locate WTP at sites where there is no risk of flooding or other hazards that might impair functioning of the plant or present a risk of damage to the plant or its environs	Flood statistics data of the project area needs to be reviewed
		Consult the relevant national/local archaeological agencies regarding the archaeological potential of proposed sites of WTP, tube wells, and primary mains, to ensure that these are located in areas where there is a low risk of chance finds	
		Locate pipelines within ROW of other linear structures (roads, irrigation canals), to reduce the acquisition of new land	Minimize land acquisition
		Ensure that pipeline routes do not require the acquisition of land from individual farmers in amounts that are a significant proportion of their total land holding (>10%)	
		Ensure that improvements in the water supply system are combined with improvements in sewerage and drainage to deal with the increased discharge of domestic wastewater	
		Do not involve use or handling of asbestos cement pipes. Existing asbestos cement pipes, if any, will be left as it is, but project team will ensure that pipes will be marked appropriately	
		Ensure occupational safety measures for the safe handling of chlorine, including wash area, as well as proper handling as not to result in inadequate/poor treatment and chlorination	
		Include treatment of all backwash and sludge resulting from water treatment plants and acceptable to discharge standards of the BSPCB before disposal	
3	**Sewerage and Sanitation**	Comply with all requirements of relevant national and state law, including the Water (Prevention and Control of Pollution) Act 1974	see Section II of this EARF
		Locate STP preferably 250 m from any inhabited areas, in locations where no urban expansion is expected in the next 20 years, so that people are not affected by odour or other nuisance from the	Distance restriction may be reviewed depending on the technology adopted for the treatment of waste water, site

	Components	Environmental Selection Guidelines	Remarks
		plant	availability and buffer zone planning
		Locate STP at sites where there is a suitable means of disposal for the treated wastewater effluent (e.g. into a natural water course or irrigation canal) or provide a means of disposal (e.g. new irrigation canal) as part of the scheme	
		Locate STP at sites where there is no risk of flooding or other hazards that might impair functioning of the plant and present a risk of damage to the plant or its environs	Flood statistics data of the project area needs to be reviewed
		Subproject will be implemented only with consent of State Pollution Control Board	
		Consult the relevant national and/or local archaeological agencies regarding the archaeological potential of proposed sites of STP, pumping stations and main sewers, to ensure that these are located in areas where there is a low risk of chance finds	
		Ensure that sewage is treated at all times to national wastewater discharge standards, and confirm this by regular monitoring of effluent from the STP	
		Ensure that no wastewater is discharged into a water course in which it could be a hazard to downstream users (e.g. a waterway that is used for as a source of water for domestic or municipal supply)	
		Locate sewage pipelines within the ROW of roads wherever feasible, to reduce the acquisition of new land	
		Ensure that routes of sewage mains do not require the acquisition of land from individual farmers in amounts that are a significant proportion of their total land holding (10%)	
		Avoid locating sewage pumping stations and wet wells within 50m of any inhabited areas, and within 100m of sensitive sites such as hospitals, schools, temples, etc, to minimize nuisance impacts from odour, rodents, etc.	Distance restriction may be reviewed depending on the technology adopted, suitable land availability and buffer zone planning
		Include measures to ensure the safe disposal of sewage sludge without causing an environmental hazard, and if possible to promote its safe and beneficial use as an agricultural fertilizer	

EIA – Environmental Impact Assessment; NOC – No Objection Certificate, ROW – right of way; STP – sewage treatment plant; WTP – water treatment plant.

B. Environmental Assessment Procedures for Subprojects

46. Subprojects must comply with national and state legislation (Section II) and ADB SPS. Summary of relevant sections of the SPS are shown in **Appendix 6**. For subproject processing, the steps to be followed are shown in **Table 5 and Figure 1**.

Table 5: Environmental Procedures for Subproject Processing

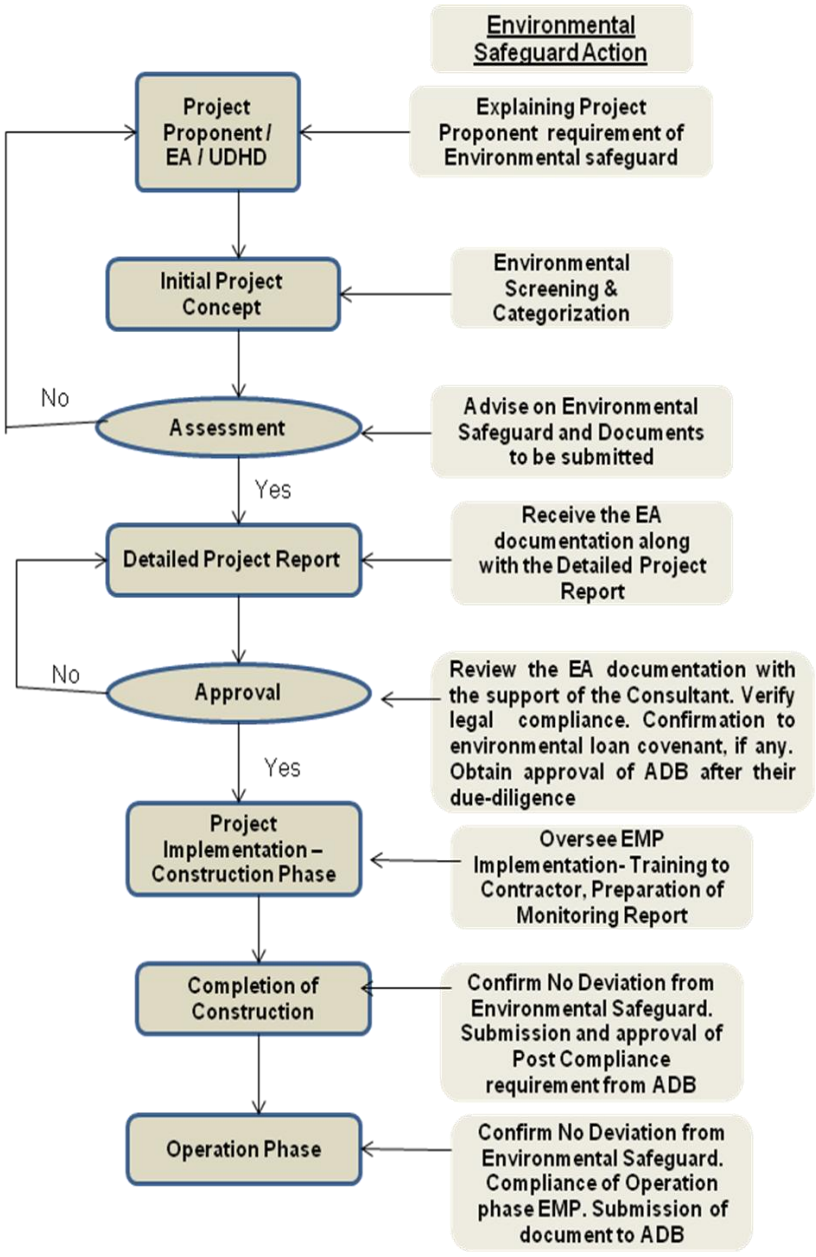
Project Stage	ADB Procedure	Government of India
Sub-project Identification	REA checklist	Categorization (A or B) according to Schedule and General/Specific Conditions in the government's EIA Notification, 2006

Project Stage	ADB Procedure	Government of India
	Categorization (A/B/C)	Application for Prior Environmental Clearance after the identification of the prospective site, or before commencing any construction, or land preparation. Category A requires environmental clearance from MOEF. Category B requires environmental clearance from SEIAA. In the absence of SEIAA or SEAC, Category B treated as Category A and will be cleared from MoEF.
	Meets subproject selection criteria	Screening (for Category B) subject by SEAC. Categorized as B1 (requires full EIA) or B2 (does not require full EIA).
Detailed Design	EIA/IEE	Scoping and TOR for EIA (A or B1) with scrutiny by EAC. TOR (or rejection of environmental clearance) finalized by EAC or SEAC within 60 days. Approved TOR posted on MOEF or concerned SEIAA website.
	Public Consultation: 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 environmental assessment report.	Public Consultation for Category A and B1 projects and consists of two components: (i) public hearing conducted by SPCB or UTPCC within 45 days of a request from the applicant, and (ii) Obtain written responses. Draft EIA publicized widely before hearing. Notice of public hearing within 7 days of date. 30 days for public responses. Incorporate concerns expressed into the draft EIA and EMP.
	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 in an accessible place and in a form or language understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.	Draft EIA publicized widely before hearing. Notice of public hearing within 7 days of date. 30 days for public responses. Incorporate concerns expressed into the draft EIA and EMP.
	Mitigation measures specified in IEE/EIA study incorporated in project design.	
	Identify and incorporate environmental mitigation and monitoring measures (including the EMP) into bid/contract documents.	
Appraisal	EMP and other environmental covenants are incorporated into the Facility Framework Agreement, Loan/Project Agreement, and Facility Administration Memorandum (FAM)	Appraisal of application completed by EAC or SEAC within 60 days of receipt of final EIA report.
Approval	The Government and the State to ensure that the design, construction, operation and implementation of all sub-project facilities is carried out in accordance with the EARF and environmental assessments agreed upon between the Government and ADB, and complies with the Government's environmental laws and regulations and ADB	PMU/ BUIDCO to review the REA checklists and reconfirm the categorization Environmental clearance decision within 60 days of the receipt of the recommendations of the EAC or SEAC or within 120 days of the receipt of the final EIA. Where EIA is not required, within 120 days of the receipt of the

Project Stage	ADB Procedure	Government of India
	SPS. The Government will ensure ADB approval based on EIA/IEE compliance with ADB guidelines and procedures, and subproject selection guidelines. ADB to review and clear EIA/IEE prior to approval and issuance of tender documents during detailed design stage. Complete EIA/IEE disclosed to public.	complete application and requisite documents
Contract Award	Obtain necessary environmental clearances, consents, and NOCs prior to contract award. Contractors submit Environmental Implementation Plans (EIP) based on EIA/IEE findings to be incorporated into bidding documents and civil award contracts.	Necessary environmental clearance obtained prior to commencing any construction, or land preparation. NOCs, CFE and CFO from BSPCB; and Forest clearances (if any) from DFO
Implementation	EMP implementation reflected in FAM. Periodic monitoring reports. Periodic monitoring report from PMU/BUIDCO.	Project must submit half-yearly compliance monitoring reports on 1st June and 1st December. All compliance reports are public documents and displayed on website of concerned regulatory authority

BSPCB – Bihar State Pollution Control Board; BUIDCO – Bihar Urban Infrastructure Development Corporation, CFE – Consent for Establishment, CFO – Consent for Operation, DFO – Divisional Forest Officer, DSC – Design and Supervision Consultant, EAC - Environmental Appraisal Committee, EARF – Environmental Assessment and Review Framework, EIA – Environmental Impact Assessment, EMP – Environmental Management Plan, FAM – Facility Administration Memorandum, IEE – Initial Environmental Examination, MoEF – Ministry of Environment and Forest, NOC – No Objection Certificate, PMC – Project Management Consultant, PMU – Project Management Unit, REA – Rapid Environmental Assessment, SEAC – State Environment Assessment Committee, SEIAA – State Environment Impact Assessment Authority, STP – sewage treatment plant, TOR – Terms of Reference, ULB – Urban Local Body, UTPCC – Union Territory Pollution Control Board, WTP – water treatment plant.

Figure 1: Flow Chart: Project Cycle and Environmental Safeguard



ADB = Asian Development Bank, EMP = Environmental Management Plan, UDHD = Urban Development and Housing Department.

1. Screening and Classification/Categorization

47. Because under Government requirements, water supply and sewerage and sanitation subprojects are not categorized (EIA Notification 2006, see also Section II), ADB screening and categorization procedures will be followed for the Project. Subproject screening and categorization is done at the earliest stage of project preparation when sufficient information is available for this purpose. Screening and categorization is undertaken to (i) reflect the significance of potential impacts or risks that a project might present; (ii) identify the level of

assessment and institutional resources required for the safeguard measures; and (iii) determine disclosure requirements.

48. A subproject's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the subproject's area of influence. Each proposed subproject is scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. Subprojects are assigned to one of the following four categories:

(i) **Category A.** Subproject components that are projected to have potentially significant adverse environmental impacts. An environmental impact assessment (EIA) is required;

(ii) **Category B.** Subproject components that are projected to have some adverse environmental impacts, but they are expected to be less significant than those associated with category A projects. An IEE is required to determine whether an EIA is warranted. If an EIA is not needed, the IEE is regarded as the final environmental assessment report; and

(iii) **Category C.** Subproject components that are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are still reviewed.

49. The ADB Rapid Environmental Assessment (REA) Checklists[5] for water supply and sewerage and sanitation (**Appendix 7**) shall be accomplished during screening. Basic environmental information relating to subproject location and project preliminary design needs to be collected for completing the checklist.

2. Preparation of EIA/IEE Report

50. After subproject categorization, the environmental assessment requirement can be determined. For subprojects projected to have potentially significant adverse environmental impacts (categorized as A) an EIA will be prepared. Subprojects with some adverse environmental impacts, but are expected to be less significant than those of category A projects, an IEE is required.

51. For preparing EIA and IEE relevant primary data will be generated and secondary data will be collected for project-influenced sites. An assessment of project impacts and risks on biodiversity and natural resources will also be undertaken. Issues regarding natural and critical habitats will be covered in the EIA/IEE report. In case of subprojects located within buffer zone of protected areas, a review of management plans and consultation with concerned management staff of the protected area, local communities, and key stakeholders will be undertaken and reflected in EIA/IEE report. Pollution prevention for conservation of resources particularly technology for management of process wastes will be addressed in the EIA/IEE report. Occupational health safety and community health safety will be properly addressed in the EMP section of the EIA/IEE report. In case subprojects are likely to have adverse impacts on physical cultural resources, appropriate mitigation measures will to be planned and reflected in the EIA/IEE. EIA/IEE will also reflect meaningful consultation and disclosure process with a provision of grievance redress mechanism. Format and scope of environmental assessment is provided in **Appendix 8**.

[5] REA checklists are prepared to support the environmental categorization of a project. The checklists can be downloaded from http://adb.org/documents/Guidelines/Environmental_Assessment/eaguidelines002.asp

52. ADB requires that an EMP must be developed as part of the EIAs for category A, and IEEs of Category B projects. EMPs describe the environmental management measures that will be carried out to mitigate negative impacts or enhance the environment during implementation of a project, and the environmental monitoring to be conducted to ensure that mitigation is provided and is effective in reducing impacts, or to determine the long-term impacts of a project. EMPs for Category A and B subprojects shall outline specific mitigation measures, environmental monitoring requirements, and related institutional arrangements, including budget requirements.

53. The EMP will include the proposed mitigation measures, environmental monitoring and reporting requirements, emergency response procedures, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Where impacts and risks cannot be avoided or prevented, mitigation measures and actions will be identified so that the project is designed, constructed, and operated in compliance with applicable laws and regulations and meets the requirements specified in this document. The level of detail and complexity of the environmental planning documents and the priority of the identified measures and actions will be commensurate with the project'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.

54. 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.

55. The requirements of national environmental laws that apply to BUDP subprojects are summarized in **Section II.** Which indicates that in terms of compliance, subprojects may be of three types: (i) subprojects that attract the EIA Notification; (ii) subprojects that require clearance/NOCs or consent from competent Government agencies; and (iii) subprojects that require no environmental authorization. Though in **Table 5** above indicates complete government procedure for preparation of EIA and environmental clearance but for the Project (which only includes water supply and sewerage and sanitation subprojects), there is no need to prepare an EIA report and subsequently environmental clearance is not required. Only NOCs, i.e. CFE and CFO from BSPCB will be required for implementation of the Project.

56. After documentation of EIA/IEE report the project approval follows the procedure as shown in **Table 5**.

V. CONSULTATION, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM

A. Public Consultation and Information Disclosure

57. Stakeholder consultation and participation (C&P) is part of the project preparation and implementation strategy. A C&P Plan has been prepared for the Project. Stakeholders contributed to subproject selection and prioritization and their contribution will be continuously solicited detailed design, and planning, implementation, and post-implementation phases. By

addressing stakeholder needs, there is greater awareness of the benefits, and 'ownership' of the Project among stakeholders, which in turn contributes to project sustainability. The consultation process so far has solicited inputs from a wide range of stakeholders, including state and ULB level government officials, experts and researchers[6] including gender specialists,[7] NGOs, elected representatives, residents of sample towns, marginalized/vulnerable beneficiary groups, and project affected persons.[8]

58. Consultation, participation and disclosure will ensure that information is provided and feedback on proposed subproject design is sought early, right from the project preparation phase, so that the views/preferences of stakeholders including potential beneficiaries and affected people can be adequately considered in project design, and continue at each stage of project preparation, processing, and implementation. Affected persons will be consulted at various stages in the project cycle to ensure: (i) incorporation of views/concerns of APs on compensation/resettlement assistance and environmental mitigation measures; (ii) inclusion of vulnerable in project benefits; (iii) identification of help required by APs during rehabilitation, if any; and (iv) avoidance of potential conflicts/smooth project implementation. It will also provide adequate opportunities for consultation/participation to all stakeholders and inclusion of the poor/vulnerable/marginalized and project-affected persons in the project process. Relevant information about any major changes to project scope shall be shared with beneficiaries, affected persons, vulnerable groups, and other stakeholders.

59. A variety of approaches can be adopted. At minimum, stakeholders shall be consulted regarding the scope of the environmental and social impact study before work is commenced and they shall be informed of the likely impacts of the subproject and proposed mitigation once the draft EIA/IEE, resettlement plan, and IPP reports are prepared. The reports shall record the views of stakeholders and indicate how these have been taken into account in project development. Consultations will be held with a special focus on vulnerable groups.

60. The key stakeholders to be consulted during subproject preparation, Environmental Management Plan implementation and project implementation include:

(i) beneficiaries;
(ii) elected representatives, community leaders, religious leaders and representatives of community based organisations;
(iii) local NGOs;
(iv) local government and relevant government agency representatives, including state and local authorities responsible for land acquisition, protection and conservation of forests and environment, archaeological sites, religious sites, and other relevant government departments;
(v) residents, shopkeepers and business people who live and work alongside the roads where pipes will be lay and near sites where facilities will be built;

[6] For example, consultations were held with academicians and researchers in Bhagalpur University, involved in research on environmental issues and Gengetic dolphin conservation, on potential impacts of the proposed Bhagalpur water supply sub-project on the ecology, river ecosystem and endangered species found in the same. Refer EIA for Bhagalpur Water Supply sub-project for details.

[7] A Focus Group Discussion on integration of gender issues in project design was held in Patna with 4 local NGOs, namely, Taru Mitra, Asian Development Research Institute, Participatory Research in Asia and Nav Manas Kalyan Samiti on April 9, 2011, and with the Women's Development Corporation, Bihar on April 11, 2011. The discussions helped understand gender issues in the context of Bihar better; practical suggestions received from the NGOs have been incorporated into the Gender Action Plan for BUDP

[8] For example, discussions with potential APs during transect walks in Bhagalpur helped understand their concerns related to disruption of economic activities during festival seasons, when they have their highest sales. This has been incorporated in the resettlement plan for Bhagalpur Water Supply sub-project.

(vi) custodians, and users of socially and culturally important buildings;
(vii) UDHD and BUIDCO, PMU and PIU staff, implementing NGO and consultants, and
(viii) ADB and Government of India.

61. Information is disclosed through public consultation and making relevant documents public locations. UDHD/BUIDCO will submit to ADB the following documents for disclosure on ADB's website:

(i) For category A subprojects - draft EIA (including the draft EMP)/IEE, as applicable and resettlement plan/IPP including the draft Entitlement Matrix, at least 120 days prior to ADB Board consideration, and/or environmental assessment and review frameworks before project appraisal, where applicable;
(ii) For category B project - draft IEE;
(iii) the final EIA/IEE and resettlement plan/IPP;
(iv) a new or updated EIA/IEE and resettlement plan/IPP and corrective action plan prepared during project implementation, if any; and
(v) the environmental and social monitoring reports.

62. The executing agency will provide relevant environmental/resettlement information in a timely manner, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.

63. The C&P Plan identifies consultation and disclosure activities with specific reference to resettlement planning and implementation and environmental assessment and implementation of EMP to be followed for each subproject and the institutions responsible, see **Appendix 11**.

B. Grievance Redress Mechanism

64. **Common Grievance Redress Mechanism:** A common grievance redress mechanism (GRM) will be in place for social, environmental or any other Project/sub-project related grievances; each resettlement plan, IPP, and IEE/EIA will follow the grievance redress mechanism described below, which is developed in consultation with stakeholders, including affected persons and NGOs.[9]

65. Goals for the GRM: The GRM will provide an accessible platform for receiving and facilitating resolution of affected persons' grievances related to the Project.

66. Grievance Redress Process: Grievances/suggestions of APs can be dropped in suggestion boxes or conveyed through phone or mail.[10] The Community Liaison Officer of the implementing NGO[11] will be responsible for conducting periodic community meetings with affected communities to understand their concerns and help them through the process of

[9] The Draft Grievance Redress Process has been circulated and discussed with the following Bihar-based NGOs and research institutes working on environment, social and gender issues, for comments: Asian Development Research Institute, Participatory Research in Asia, Nav Manas Kalyan Samiti and Taru Mitra. It will be discussed with town-level stakeholders at the disclosure workshop proposed in Bhagalpur.

[10] The Grievance Registration/Suggestion Form shall be downloadable from the GoB, PMU and PIU website and will be available at the respective Complaints Cells. Refer to **Appendix 9** for a Sample Grievance Registration Form.

[11] The Community Liaison Officer of the implementing NGO shall be trained by the project consultants. It will be important to ensure appointment of an approachable, reliable and responsible person with an understanding of perspectives of different stakeholders.

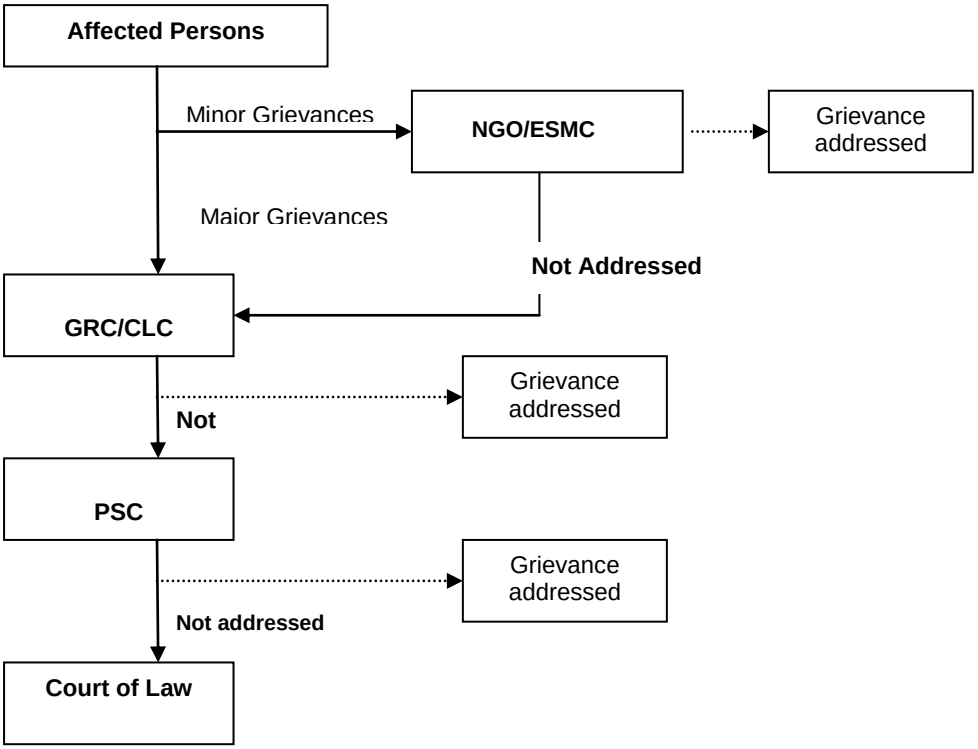
grievance redressal (including translation from local dialect/language, recording and registering grievances of non-literate APs and explaining the process of grievance redressal).

67. Grievances will first be registered at the Complaints Cell[12] of the implementing NGO/PIU, who will resolve smaller issues and in case of larger issues, consult/seek the assistance of the Environment and Social Mangement Coordinator (ESMC of the PMU). Grievances not redressed through this process within one month of registration will be brought to the notice of the City Level Committees (CLC) set up to monitor project implementation in each town. As a Grievance Redressal Committee, the CLC will meet every month (if there are pending, registered grievances), determine the merit of each grievance, and resolve grievances within a month of receiving the complaint—failing which the grievance will be addressed by the state-level Program Steering Committee (PSC)[13]. Further grievances will be referred by APs to the appropriate courts of law. The grievance redress process is shown in **Figure 2**. The GRCs will continue to function throughout the project duration.

[12] Affected Persons will be able to register grievances - social, environmental or other, at Complaints Cells to be established at the ULB/PIU office and the panchayat office of the affected village, if any, or, in a location easily accessible to affected communities (e.g. fishing community / riverbank communities). The Community Liaison Officer in the implementing NGO should be able to correctly interpret/record verbal grievances of non-literate persons and those received over telephone. The Complaints Cells shall also serve as Public Information Centres, where, apart from grievance registration, information on the project, sub-projects, social and environmental safeguards shall be provided.

[13] Grievances pertaining to broader concerns related to the program/sub-project, i.e., those not necessarily confined to the city/district shall be directly forwarded to the PSC if received at the city-level Complaints Cell. There will be a Grievance Registration/Complaints Cell at PMU office (state-level) as well, which will evaluate the area of jurisdiction of a particular grievance and either advise the NGO/PIU on resolution or forward it to GRC/PAC for resolution.

Figure 2: Grievance Redress Mechanism Process



CLC- City Level Committee, ESMC-Environment and Social Management Coordinator, GRC- Grievance Redress Mechanism, NGO-Non Government Organization, PSC-Project Steering Committee

68. **Composition of GRC and PSC:** The CLC, acting as a Grievance Redress Committee (GRC) will have District Magistrate (Chairperson), Mayor, Municipal Commissioner, Head, Project Implementation Unit (Convener), and City Level Heads of relevant departments (such as BRJP, Road Construction Department, PHED, Electricity Board, State Pollution Control Board, Police, etc. and departments such as Forest Department, Railways etc.)[14]; Chairpersons of the concerned Municipal Corporation's Standing Committee; ULB officials including Municipal Engineer, Town Planning Officer, Medical and Health Officer; representatives from the affected village panchayat/community, if any, eminent citizens, CBOs and NGOs. The GRC/CLC must have a minimum of two women members. In case of any IP impacts in future sub-projects (not envisaged in case of Bhagalpur (Tranche 1) and Muzaffarpur (Tranche 2), the GRC/CLC must have representation of the affected IP community, including at least one woman IP, the chief of the tribe or a member of the tribal council as traditional arbitrator (to ensure that traditional grievance redress systems are integrated) and an NGO working with IP groups.

69. **The PSC shall include Development Commissioner;** Principal Secretary, Finance; Principal Secretary, Planning and Development; and Principal Secretary, Urban Development and Housing.

70. **Areas of Jurisdiction:** The areas of jurisdiction of the GRC–headed by the District Magistrate, will be (a) all locations/sites within the district where sub-project facilities are

[14] All departmental representatives will not be required to attend every GRC meeting; only those required for specific grievances need be present in relevant meetings. The District Magistrate shall decide which departmental heads would be invited for specific meetings.

proposed, or (b) their areas of influence within the District. The PSC shall have jurisdictional authority across the State (i.e., areas of influence of sub-project facilities beyond district boundaries, if any).

71. **Consultation Arrangements:** This will include (a) group meetings and discussions with APs, to be announced in advance and conducted at the time of day agreed on with APs (based on their availability) and conducted by the Community Liaison Officer (CLO) of the implementing NGO and PIU, at least twice during resettlement plan preparation, quarterly in the first year and half-yearly in subsequent years of resettlement plan implementation to address general/common grievances; and (b) availability of CLO Implementing NGO and Environment and Social Management Coordinator of PMU on a fixed day of every week/fortnight (as required, based on the number of grievances) for one-to-one consultations. The Implementing NGO will be responsible for ensuring that non-literate APs/ vulnerable APs are assisted to understand the grievance redress process, to register complaints and with follow-up actions at different stages in the process.

72. **Record-keeping:** Records will be kept by the PIU of all grievances received including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date these were effected, and final outcome.

73. **Information Dissemination Methods of the GRM:** The Implementing NGO shall be responsible for information dissemination to APs on grievance redressal procedure, who to contact and when, where/how to register grievance, various stages of grievance redress process, time likely to be taken for redressal of minor and major grievances etc. Grievances received and responses provided will be documented and reported back to the affected persons, at the time of grievance registration (**Appendix 9** has the Sample Grievance Registration Form). The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the offices of the concerned local panchayat, ULB notice board and web.[15]

74. **Periodic Review and Documentation of Lessons Learned:** The Implementing NGO/PIU shall periodically review the functioning of the GRM and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

75. **Costs:** All costs involved in resolving the complaints (meetings, consultations, communication and reporting / information dissemination) will be borne by the PMU.

VI. INSTITUTIONAL ARRANGEMENT AND RESPONSIBILITIES

A. Implementation Arrangements

76. The Urban Development and Housing Department (UDHD) of Government of Bihar is the executing agency for the Project, which will receive strategic directions from a state-level Steering Committee. The Project Management Unit (PMU) within UDHD will have an Environment and Social Management Coordinator (ESMC). BUIDCO, a company fully owned by Government of Bihar, which specializes in implementation of investment projects, will house the Project Implementation Unit (PIU) at state-level (Patna). The ULBs and BUIDCO will enter into agreements, which authorize BUIDCO to manage the subprojects on behalf of the ULBs. Once

[15] This will also serve as an indicator for PPMS.

the assets are created, BUIDCO will transfer them to the respective ULBs for operation and maintenance. PIU field offices shall be set up in each project town to manage the implementation of sub-projects. In addition, City Level Committees will be set up in each project town to periodically review subproject progress, facilitate smooth implementation and finalize proposals for any legal, operational and financial changes required, in discussion with the PMU and UDHD.

77. The PMU, with support from PIU/PIU field offices (and implementing NGOs in case of resettlement and/or IP issues) will ensure mitigation of negative environmental and social impacts due to the subproject, if any. The PMU will be assisted by Project Management Consultants (PMC) who will provide project management support, assure the technical quality of design and construction, prepare EIA/IEE/resettlement plan/IPP reports and provide advice on policy reforms. The PMU will endorse subproject IEEs/EIAs and resettlement plans/IPPs prepared by the PMC and will have financing and monitoring responsibilities. It will co-ordinate with national and state agencies to resolve inter-departmental issues, if any.

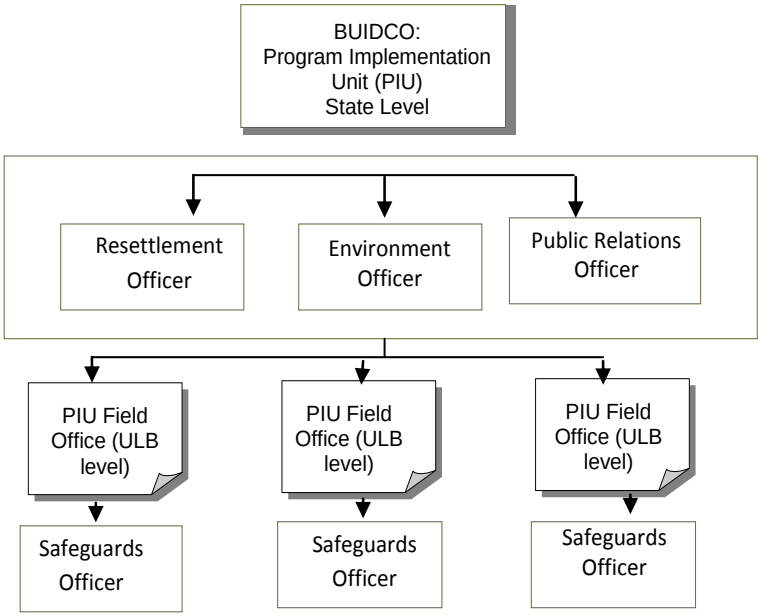
78. **Responsibilities of the PMU Environment and Social Management Coordinator (ESMC).** He/she will (i) address environmental and social safeguards issues; (ii) implementation the EARF/resettlement framework/IPF by the PIU/implementing NGO; (iii) monitor physical and on-physical activities under the Project; (iv) monitor implementation of safeguards plans; (v) guide PIU as and when necessary; and (vi) endorse/submit periodic monitoring reports received from PMC to the Program Director, PMU who will then submit these to ADB. The monitoring report will focus on the progress of implementation of the IEE/EIA and EARF, resettlement plan/resettlement framework and IPP/IPF, issues encountered and measures adopted, follow-up actions required, if any, as well as the status of compliance with subproject selection criteria, and relevant loan covenants. The PMU will seek GoB clearance for submission and disclosure of the environmental and social monitoring report to ADB.The ESMC will be assisted by the PMC on environmental and social issues.

79. The PMC will have an Environment Specialist (ES) and Resettlement/Social Development Specialist who will be responsible for the preparation of IEE/EIA and resettlement plan/IPP reports respectively. The PMC ES and Resettlement/Social Development Specialist will (i) review and finalize all reports in consultation with the PMU ESMC; (ii) submit periodic monitoring and implementation reports to PMU, who will take follow-up actions, if necessary.

80. The PIU at state-level will have an Environment Officer (EO) and Resettlement Officer (RO) who will be responsible for implementation of the EMP in each EIA/IEE and the resettlement plan/IPP respectively. Both officers will undertake surveys and record their observations throughout the construction period to ensure that safeguards and mitigation measures are provided as intended. The PIU through the Implementing NGO will be responsible for delivery of entitlements to APs. Both will be responsible for (i) implementing and monitoring safeguards compliance activities, public relations activities, gender mainstreaming activities and community participation activities; (ii) obtaining statutory clearances and obtaining NOCs from government agencies/other entities and entering into agreements with them for use of their land; and (iii) coordinating for obtaining right of way clearances with related State and National agencies.

81. PIU field offices in program towns will have a Safeguard Officer who will be responsible for data collection for IEE/EIA and resettlement plan/IPP preparation and implementation. PIU field offices will obtain right of way clearances and prepare progress reports with respect to IEE/EIA and resettlement plan/IPP implementation.

Figure 1: Environmental Safeguards Organizational Chart



82. **Table 6** gives the institutional roles and responsibilities for preparation and implementation of IEE/EIA and other environmental documents.

Table 6: Institutional Roles and Responsibilities: Environmental Safeguard

PMU	ADB
Subproject Identification Stage	
Environmental and Social Management Coordinator in PMU screen subprojects with inputs from PIU based on the EARF subproject selection guidelines with assistance from PMC	
Detailed Design Stage	
PMU to review design changes and if these warrant classification of the change, initiate the Environment Assessment process in accordance with the EARF, and revise the IEE/EIA/EMP in accordance with detailed design changes as warranted	
Pre-construction stage	
• PMU (through PMC) to conduct Rapid Environmental Assessment (REA) for each subproject using checklists Based on the REA, categorize the subproject on the basis of ADB's Guidelines • To fulfill ADB requirements PMC will assist the PMU in conducting EIAs for Category A and IEEs for Category B subprojects. If warranted from IEE review, an EIA to be conducted and submitted. An REA may also trigger an EIA. For Category C subprojects no EIA or IEE is required, the PMU to provide generic mitigation measures, if any, to be implemented. • PIU will be responsible for data management for	• ADB (and BUIDCO/PMU) to review the REA checklists and reconfirm the categorization. The ADB will review and approve IEE/EIA reports of all Category A and Category B subprojects. Notwithstanding these thresholds, in each tranche ADB will review at least one subproject of each sectors (say water supply, waste water) being implemented under respective tranche. In addition, the updated and finalized IEE/EIA reports of all tranche subprojects will be reviewed and cleared by ADB prior to approval and issuance of tender documents.

PMU	ADB
IEE/EIA and supply these to PMC/PMU • PMU/PIU (through PMC) to fulfill the government and State environmental requirements including: CFE and CFO for sewage treatment plants (STPs), water treatment plants (WTPs), diesel generators, hot mix plant etc. from BSPCB; and Forest/Wildlife Clearances if any. • PMU (through PIU/PMC) to conduct public consultation and disclosure during IEE/EIA process and comments shall be reflected in the IEE/EIA report. • PMC to monitor the disclosure and public consultation. • PMU with the help of PIU will apply for any CFO renewals if required.	
After confirmation of approval of IEE/EIAs, PMU with the assistance of Project Consultants to disclose the IEE/EIA and EMP to the public as required by ADB Guidelines. Draft EIA reports are to be made available to the public for Category A projects 120 days before ADB Board consideration. All IEEs/EIAs are uploaded in ADB and Project website	
Project Consultants (PMC), on behalf of PMU, to incorporate mitigation measures in project design, specified in IEE/EIA study.	
PMU with the assistance of Project Consultants (PMC/DSC) to identify and incorporate environmental mitigation and monitoring measures into contract documents.	
Construction Stage	
• PIU and DSC to monitor the implementation of mitigation measures by Contractor. • PMC to prepare monthly/quarterly progress reports including a section on implementation of the mitigation measures (application of EMP and monitoring plan) and submit to PMU for review • PMU to review the progress reports to ensure that all mitigation measures are properly implemented. • PMC consolidate the monthly reports and submit quarterly reports to PMU and after finalization through PMU will be submitted to ADB for review. • PMC (as per EMP) will conduct environmental quality monitoring during construction stage (ambient air and noise, and water quality). • PMU/PMC to assist BUIDCO to prepare the annual monitoring report on environment by focusing on the progress in implementation of the EMP and EARF and issues encountered and measures adopted, follow-up actions required, if any. PMU will submit annual monitoring report and will include in the report, the status of Project compliance with subproject selection criteria, and with relevant loan covenants. PMU will seek clearance for submission and disclosure of the	ADB and PMC to review the reports and provide necessary advice as needed to the PMU ADB to review the monitoring report and post on ADB website

PMU	ADB
annual environmental monitoring report to ADB.	
Operation Stage	
• ULB/PMU to conduct monitoring, as specified in the environmental monitoring plan. • The Bihar State Pollution Control Board (BSPCB) to monitor the compliance of the standards regarding drinking water quality, ground water, ambient air, effluent quality from treatment plant, if applicable.	

BSPCB = Bihar State Pollution Control Board, BUIDCO = Bihar Urban Infrastructure Development Corporation, CFE = Consent for Establishment, CFO = Consent for Operation, DSC = Design and Supervision Consultant, EARF = Environmental Assessment and Review Framework, EARP = Environmental Assessment and Review Procedure, EIA = Environmental Impact Assessment, EMP = Environmental Management Plan, IEE = Initial Environmental Examination, PMC = Project Management Consultant, PMU = Project Management Unit; REA = Rapid Environmental Assessment, STP = sewage treatment plant, ULB = Urban Local Body, WTP = water treatment plant

B. Institutional Capacity

83. Since no externally-aided urban infrastructure projects requiring capacity for environmental management planning, resettlement planning, implementation and monitoring in accordance with internationally accepted guidelines/safeguards frameworks have been implemented in Bihar yet and presently, entities such as BUIDCO and ULBs do not have environmental/social safeguards personnel, capacity to handle environmental/IR/IP impacts, gender and vulnerability issues etc. needs to be built. The project management consultants (PMC) will be responsible for training of PMU and PIU staff on aspects such as environmental planning/resettlement planning/implementation, social protection and gender, including the specific recording, reporting and disclosure requirements.

84. Owing to the complexity of projects with IP issues, there will be a special focus on capacity building of government agencies and PMU/PIU staff on social (distinct social, economic and cultural traits and traditions of indigenous peoples and the importance of preserving the same, including indigenous knowledge systems, etc.), legal (traditional rights over land and land tenure issues) and technical aspects in such projects, with an adequate budgetary provision for the same.

85. PMC will also be responsible for training of the implementing NGO on provisions of EARF/resettlement framework/IPF. Further, capacity building of community based organizations (CBOs including IP groups) in the project area will be undertaken by the implementing NGO to ensure that they are able to represent the affected groups more effectively. The Project Management Consultants shall undertake this task with external resources, e.g., anthropologists and development practitioners with relevant experience, as required.

86. Additional measures to enhance institutional capacity include exposure visits of PMU, PIU and Implementing NGO staff to other Indian states that have successfully implemented ADB funded projects; costs for exposure visits (including those related to safeguards) are included in Detailed Cost Estimates for the Project.

C. Staffing Requirement and Budget

87. Costs required for ensuring environmental safeguards cover the following activities:

(i) Conducting IEE or EIA studies, preparing and submitting reports and public consultation and disclosure;
(ii) Application for Consent to Establish and Operate where required (currently STP and WTP); and
(iii) Implementation of environmental management plans (EMP) (including long-term surveys/monitoring/ data generation etc.).

88. For budgeting purposes it is assumed that subprojects of future Tranches (on the basis of following the environmental subproject selection guidelines) which involve the provision of new or refurbished infrastructure will be classified as Category B (requiring IEE). In practice the executing agency shall aim to produce a single document that serves government and ADB requirements to avoid duplication of effort.

89. Generally an IEE relies on the collection of existing data in order to describe environmental conditions in the project area, and it is not expected that new surveys would be conducted. The work thus involves the collection and analysis of data on the existing environment and the proposed project, assessment and mitigation of impacts, preparation of the Environmental Management Plan (EMP) and budget, public consultation, and preparation of the IEE report. An average IEE for this type of subproject requires one month of effort by one expert and one support staff (specialising in the natural environment and social issues). Other expenses are the cost of public consultation meetings, and the cost of document disclosure.

90. The costs of these various inputs are shown in **Table 7**.

Table 7: Staffing and Cost of EARF Implementation

Item	Quantity	Unit Cost (INR)	Total Cost (INR)	Sub-total (INR)
1. BUIDCO- PMU (Bihar Urban Infrastructure Development Corporation- Project Management Unit)				
Environment and Social Management Coordinator	Considered under Project TOR and Project cost			
2.Project Management Consultant (PMC)				
Environment Specialist	Considered under Project TOR and Project cost of Consultant			
3. Other Expenses				
Consent to Establish by BUIDCO	Lump sum- 4 subprojects	30,000	120,000.00	1,20,000.00
Consent to Operate by BUIDCO	Lump sum- 4 subprojects	20,000	80,000.00	80,000.00
Monitoring Expenses during implementation	As per requirement- Tr 1	-		
	(i) Air, noise and water quality monitoring	Quarterly for 36 months total construction @ 30,000 per quarter	3,60,000.00	
	(ii) Biodiversity mitigation monitoring	Monthly for 18 months construction of intake structure – 20,000 per month	3,60,000.00	7,20,000.00
Monitoring Expenses during Implementation	3 sub-projects (Tr-2 and 3) Lump sum – 2 times per year	60,000 per sub-project per year for 2.5 yrs. Construction	4,50,000.00	4,50,000.00
Public consultations	Tranches- 1,2 and	Tranche 1:	1,40,000.00	**1,40,000.00**

Item	Quantity	Unit Cost (INR)	Total Cost (INR)	Sub-total (INR)
	3	50,000.00 Tranche 2: 30,000.00 Tranche 3: 60,000.00		
TOTAL				**15,100,00.00**

BUIDCO-Bihar Urban Infrastructure Development Corporation, INR-Indian Rupees, PMC-Project Management Consultant, PMU-Project Management Unit

VII. MONITORING AND REPORTING

91. The PMU will monitor and measure the progress of EMP implementation. The monitoring activities will be corresponding with the project's risks and impacts and will be identified in the environmental assessment for the subproject. In addition to recording information like progress of the work, deviation of work components from original scope, the executing agency will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome. For projects likely to have significant adverse environmental impacts, the executing agency will retain qualified and experienced external experts to verify its monitoring information. The executing agency will document monitoring results, identify the necessary corrective actions, and reflect them in a corrective action plan. The executing agency in each quarter will study the compliance with the action plan developed in the previous quarter. Compliance with loan covenants will be screened by the executing agency.

92. PMU with the help of PMC will prepare periodic monitoring reports that describe progress with implementation of the EMP and compliance issues and corrective actions, if any. They will submit quarterly and semi-annual monitoring reports during construction for projects likely to have significant adverse environmental impacts. For projects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis. Such periodic reports will be posted in a location accessible to the public. The suggested monitoring report format is in **Appendix 10**. Project budgets will reflect the costs of monitoring and reporting requirements.

APPENDIX 1: BIHAR URBAN DEVELOPMENT INVESTMENT PROGRAM

Subproject	Goal	Main components	Infrastructure (New or Refurbished)
Water Supply	Improving quality and quantity of water supply to the population of Urban Local Bodies – potable water supply of 135 litres per person per day (lpcd) on average at the consumer end- through source augmentation, improvements to water treatment facilities, distribution system rehabilitation, monitoring and loss reduction	Source Augmentation	Tube wells
			Surface water intake
			Water treatment plant
			Raw water and clear water reservoir
			Chlorination facility
			Pumps and pump house
		Water Transmission	Transmission / Rising mains
			Pumping mains
			Overhead and ground level water reservoirs
			Pumps & pump house
		Network Improvement	Distribution/carrier mains
			Local network
			Bulk valves and flow meters
			House connection
			Household meter
Sewerage and Sanitation	Developing appropriate sanitation facilities or sewerage system catering to safe disposal of sewage based on sewage flow equivalent to 80 percent of net water supply to the households and maximizing population coverage based on optimum flushing velocities for the sewerage system	Sewage Treatment	Sewage Treatment Plant
			Outfall for treated effluent
		Sewage Transfer	Trunk sewer
		Network Improvements	Secondary piped network
			Tertiary piped network
			Household connections
		Procurement	Suction cum jetting machine

APPENDIX 2: BIHAR STATE POLLUTION CONTROL BOARD

30607

Application No. .....

Fee : Rs. 50/-

BIHAR

BIHAR STATE POLLUTION CONTROL BOARD

PATNA - 800 023

(TO BE SUBMITTED IN DUPLICATE)

INFORMATION FOR OBTAINING NOC U/S 25 & 26 OF THE WATER (PREVENTION AND CONTROL OF POLLUTION) ACT, 1974 & U/S 21 OF THE AIR (PREVENTION AND CONTROL OF POLLUTION) ACT, 1981.

1. **GENERAL :**

(i) Name of Industry :

(ii) (a) Name & Address (with Pin code) of applicant

(b) Telephone No. (with code) :

(iii) Location of the Project (attach location map)
Place :
P.O. :
District :

(Information is also required if industry is located outside the Industrial Area)

Mauza :

Khata No. :

Khesra No. :

(iv) At what distance (in metre) following are located from Battery limit of the plant.

(a) Railway line : (not captive)

(b) River (with name) :

(c) Monuments :

(d) Forest/Sanctuary :

(e) Human habitations : (minimum 200 permanent dwellers)

(f) National Highway/State Highway

(v) Present land use : Prime agriculture/Agriculture/Barren land/Industrial/Forest.

(vi) Topography : Hill/Plane/Rugged/Marshy.

(viii) Prevalent wind directions ..... Speed ..... km/h

(viiii) Yearly average rainfall .....

2. **BREAKUP OF PROPOSED LAND USE AT THE SITE**

(i) Area for Plant ..... Sq. Metre

(ii) Area for insfrastructure ..... Sq. Metre

(iii) Area for Effluent Treatment ..... Sq. Metre

(2)

(iv) Proposed width of plantation all around the plot in metre

North ..... South ..... East ..... West .....

2.1 (i) Whether propose to build captive colony ..... Yes/No.

(ii) Distance of the captive colony from plant site in Km. .....

(iii) Number of dwellers .....

3. **RAW MATERIALS**

(i) List of raw materials (MT/d) .....

.....

.....

.....

(ii) List of Processing Chemicals (MT/d) .....

.....

4. **SOLID WASTES**

(i) Solid wastes (MT/d) .....

(ii) Composition of wastes .....

.....

.....

.....

(iii) Enclose a writeup on Solid Waste Management.

5. **PROCESS AND PRODUCTION**

Enclose a copy of the Project Report with flow sheet

(i) List of products with daily capacity : (MT/d):-

(a) .....

(b) .....

(c) .....

(d) .....

(e) .....

(ii) List of By-products with daily capacity : (MT/d):-

(iii) State briefly the technology :

6. **WATER REQUIREMENT**

(i) Source of water supply : Well/Tubewell/River/Lake/Tank/Other Source

(ii) Water requirements (kl/d) :-

(a) Industrial .....

(b) Domestic .....

(c) Other .....

Total .....

7. **WASTE WATER**

(i) Quantity of Waste Water (KL/d) :

(a) Industrial.....

(b) Domestic .....

(c) Other .....

(ii) Trade Effluent quantity (KL/d) :

Before treatment.....

After treatment .....

(iii) Final discharge to : Land/River/Lake/Municipal drain/Industrial Area drain.

(iv) Quantity of treated effluent to be recycled.....

(v) Enclose a short write up on sludge management

8. **ATMOSPHERIC EMISSIONS**

(i) Stacks details

	Stack No. 1	No.2	No.3	No. 4
Attached to :				
Height (metre)				
Construction Material				

(ii) Mandatory provision of Porthole and Platforms in Stack(s)

(iii) Enclose a short write up on air pollution control.

9. **ENERGY**

(i) Source of Energy : D.G. Sets with capacity...../Boilers/Furnaces/Captive Power Plant/Public Supply.

(ii) Fuel Consumption (MT/d)

(a) Coal..... (d) Wood.....

(b) Diesel Oil..... (e) L.D.O.....

(c) H.S.D. ..... (f) Furnance oil.....

(g) Other source .....

(4)

10. **OTHER POLLUTION**

(i) Noise :

(a) Sound level ..... : in dB (A)

(b) Abatement measures :

(ii) Odour : Source ..... Abatement Measures .....

(iii) Thermal Pollution Source ..... Abatement Measures .....

11. **PROJECT COST IN LACS**

Cost of (a) Land Rs. ..... (b) Building Rs. .....

(c) Machinery Rs. ..... (d) Infrastructure Rs. .....

(e) Pollution Control Rs. ..... (f) Total of Project Rs. .....

12. **N O C FEE**

Amount Rs. ..... Bank Draft No ..... Date .....

payable to Bihar State Pollution Control Board at Patna.

Place : (Signature of Applicant)

Date : with Official Seal)

NOTE :

(a) In case of Major Polluting Industries, listed in Annexure III of related Guideline, E.I.A. and E.M.P. are essential.

(b) In case of modernisation/expansion activity the project proponent shall submit a separate writeup indicating there in existing and proposed pollution load.

(c) Application shall be submitted to Member Secretary, Bihar State Pollution Control Board, Beltron Bhawan, Lal Bahadur Shastrinagar, Patna - 800 023.

(d) NOC Fee (in the shape of Bank draft in favour of "Bihar State Pollution Control Board, Payable at Patna) shall be payable in the following manner : -

(1)	Cost of Scheme, 25.00 crores or above	Rs. 20,000/-
(2)	Cost of scheme, 1 crore, and above but less than 25 crores	Rs. 10,000/-
(3)	Cost of scheme, 1 lakh and above but less than 1 crore	Rs. 2,000/-
(4)	Cost of scheme less than 1 lakh	Rs. 1,000/-

APPENDIX 3: CENTRAL POLLUTION CONTROL BOARD (CPCB) APPLICABLE ENVIRONMENTAL STANDARDS

General Standards for Discharge of Environmental Pollutants: Effluents

SL.no	Parameter	Standards			
		Inland surface water	Public sewers	Land of irrigation	Marine/coastal areas
	(a)	(b)	(c)	(d)	
1.	Colour and odour	remove as far as practicable			
2.	Suspended solids mg/l. max.	100	600	200	(a) For process waste water100 (b) For cooling water effluent 10% above total suspended matter of influent.
3.	Particle size of suspended solids	shall pass 850 micron IS Sieve			(a)Floatable solids, max. 3mm. (b)Settable solids (max 850 micron)
4.	pH value	5.5. to 9.0	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
5.	Temperature	shall not exceed 5^0C above the receiving water temperature			shall not exceed 5^0C above the receiving water temperature
6.	Oil and grease, mg./l, max.	10	20	10	20
7.	Total residual chlorine, mg/l. max.	1.0			1.0
8.	Ammonical nitrogen (as N.) mg/l max	50	50		50
9.	Total Kjeldahl Nitrogen (as NH_3) mg/l. max	100			100
10.	Free ammonia (as NH_3), mg/l.max	5.0			5.0
11.	Biochemical oxygen demand (3 days at 27^0C), mg/l. max.	30	350	100	100
12.	Chemical oxygen demand, mg/l, max.	250			250
13.	Arsenic (as As) mg/l, max.	0.2	0.2	0.2	0.2
14.	Mercury (As Hg), mg/l, max.	0.01	0.01		0.01
15.	Lead (as Pb) mg/l, max	0.1	1.0		2.0
16.	Cadmium (as Cd) mg/l. max	2.0	1.0		2.0
17.	Hexavalent chro-mium (as Cr. +6). mg/l, max	0.1	2.0		1.0
18.	Total Chromium (as Cr) mg/l, max	2.0	2.0		2.0
19.	Copper (as Cu) mg/l, max	3.0	3.0		3.0
20.	Zinc (as Zn) mg/l, max	5.0	15		15
21.	Selenium (as Se) mg/l, max	0.05	0.05		0.05
22.	Nickel (as Ni) mg/l,	3.0	3.0		5.0

SL.no	Parameter	Standards			
		Inland surface water	**Public sewers**	**Land of irrigation**	**Marine/coastal areas**
	max				
23.	Cyanide (as CN) mg/l, max	0.2	2.0	0.2	0.2
24.	Fluoride (as F) mg/l, max	2.0	15		15
25.	Dissolved phosphates (as P) mg/l, max	5.0			
26.	Sulfide (as S) mg/l, max	2.0			5.0
27.	Phenolic compounds (as C_6H_5OH) mg/l, max	1.0	5.0		5.0
28.	Radioactive materials: (a)Alfa emitters microcurie/ml, max. (b)Beta emitters micro curie/ml,max.	 10^{-7} 10^{-6}	 10^{-7} 10^{-6}	 10^{-8} 10^{-7}	 10^{-7} 10^{-6}
29.	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	90% survival of fish after 96 hours in 100% effluent
30.	Manganese (as Mn)	2 mg/l	2 mg/l		2 mg/l
31.	Iron (as Fe)	3 mg/l	3 mg/l		3 mg/l
32.	Vanadium (as V)	0.2 mg/l	0.2 mg/l		0.2 mg/l
33.	Nitrate Nitrogen	10 mg/l			20 mg/l

These standards shall be applicable for industries, operations or process other than those industries operations or process for which standards have been specified in schedule of the Environment Protection Rules, 1989

CPCB Primary Water Quality Criteria

Designated-Best-Use	Class of Water	Criteria
Drinking Water Source without conventional treatment but after disinfection	**A**	❖ Total Coliform Organisms: MPN # 50 per 100Ml ❖ 6.5 # pH # 8.5 ❖ Dissolved Oxygen: ∃6 mg/L ❖ Biochemical Oxygen Demand (5 days @ 20^{o}C): # 2 mg/L
Outdoor bathing (organized)	**B**	❖ Total Coliform Organisms: MPN # 500 per 100mL ❖ 6.5 # pH # 8.5 ❖ Dissolved Oxygen: ∃5 mg/L ❖ Biochemical Oxygen Demand (5 days @ 20^{o}C): # 3 mg/L
Drinking water sources after conventional treatment and disinfection	**C**	❖ Total Coliform Organisms: MPN # 5000 per 100mL ❖ 6 # pH # 9 ❖ Dissolved Oxygen: ∃4 mg/L ❖ Biochemical Oxygen Demand (5 days @ 20^{o}C): # 3 mg/L
Propagation of wildlife and fisheries	**D**	❖ 6.5 # pH # 8.5 ❖ Dissolved Oxygen: ∃4 mg/L ❖ Free ammonia (as N): # 1.2 mg/L
Irrigation, industrial cooling, controlled waste disposal	**E**	❖ # pH # 8.5 ❖ Electrical conductivity at 25^{o}C: #2250

Designated-Best-Use	Class of Water	Criteria
		micro mhos/cm ❖ Sodium absorption ratio: Max 26 ❖ Boron: Max 2 mg/L

Indian Standards for Drinking Water - Specification (BIS 10500: 1991)

Sl.No	Substance or Characteristic	Requirement (Desirable Limit)	Permissible Limit in the absence of Alternate source
Essential characteristics			
1.	Colour, (Hazen units, Max)	5	25
2.	Odour	Unobjectonable	Unobjectionable
3.	Taste	Agreeable	Agreeable
4.	Turbidity (NTU, Max)	5	10
5.	pH Value	6.5 to 8.5	No Relaxation
6.	Total Hardness (as $CaCo_3$) mg/lit.,Max	300	600
7.	Iron (as Fe) mg/lit,Max	0.3	1.0
8.	Chlorides (as Cl) mg/lit,Max.	250	1000
9.	Residual, free chlorine, mg/lit, Min	0.2	--
Desirable Characteristics			
10.	Dissolved solids mg/lit, Max	500	2000
11.	Calcium (as Ca) mg/lit, Max	75	200
12.	Magnesium (as Mg)mg/lit, Max.	30	100
13.	Copper (as Cu) mg/lit, Max	0.05	1.5
14.	Manganese (as Mn)mg/lit ,Max	0.10	0.3
15.	Sulfate (as SO_4) mg/lit, Max	200	400
16.	Nitrate (as NO_3) mg/lit, Max	45	100
17.	Fluoride (as F) mg/lit, Max	1.0	1.5
18.	Phenolic Compounds (as C_6H_5OH) mg/lit, Max.	0.001	0.002
19.	Mercury (as Hg)mg/lit, Max	0.001	No relaxation
20.	Cadmiun (as Cd)mg/lit, Max	0.01	No relaxation
21.	Selenium (as Se)mg/lit,Max	0.01	No relaxation
22.	Arsenic (as As) mg/lit, Max	0.05	No relaxation
23.	Cyanide (as CN) mg/lit, Max	0.05	No relaxation
24.	Lead (as Pb) mg/lit, Max	0.05	No relaxation
25.	Zinc (as Zn) mg/lit, Max	5	15
26.	Anionic detergents (as MBAS) mg/lit, Max	0.2	1.0
27.	Chromium (as Cr^{6+}) mg/lit, Max	0.05	No relaxation
28.	Polynuclear aromatic hydro carbons (as PAH) g/lit, Max	--	--
29.	Mineral Oil mg/lit, Max	0.01	0.03
30.	Pesticides mg/l, Max	Absent	0.001
31	Radioactive Materials		
	i. Alpha emitters Bq/l, Max	--	0.1
	ii. Beta emitters pci/l,Max	--	1.0
32	Alkalinity mg/lit. Max	200	600
33	Aluminium (as Al) mg/l,Max	0.03	0.2
34	Boron mg/lit, Max	1	5

Ambient Air Quality Standards

Pollutant	Time Weighted Average	Industrial, Residential, Rural and Other Areas	Sensitive Area (Notified by Central Govt.)	Method of Measurement
Sulphur Dioxide (SO_2)	Annual Average[a] 24 hours Average[b]	50 µg/m^3 80 µg/m^3	20 µg/m^3 80 µg/m^3	• Improved West & Gaeke method • Ultraviolet Fluorescence
Oxides of Nitrogen (NO_X)	Annual Average[a] 24 hours Average**	40 µg/m^3 80 µg/m^3	30 µg/m^3 80 µg/m^3	• Jacobs & Hochheiser modified (NaoH – $NaAsO_2$) method • Gas Chemiluminiscence
Particulate Matter (PM_{10}) (Size <10 µm)	Annual Average[a] 24 hours Average[a]	60 µg/m^3 100 µg/m^3	60 µg/m^3 100 µg/m^3	• Gravimetric • TOEM • Beta Attenuation
Particulate Matter ($PM_{2.5}$) (Size <2.5 µm)	Annual Average[a] 24 hours Average[b]	40 µg/m^3 60 µg/m^3	40 µg/m^3 60 µg/m^3	• Gravimetric • TOEM • Beta Attenuation
Ozone (O_3)	8 hours Average[b] 1 hour[b]	100 µg/m^3 180 µg/m^3	100 µg/m^3 180 µg/m^3	• UV photometric • Chemiluminiscence • Chemical method
Lead (Pb)	Annual Average[a] 24 hours Average[b]	0.5 µg/m^3 1.0 µg/m^3	0.5 µg/m^3 1.0 µg/m^3	• AAS method after sampling using EPM 2000 or equivalent filter paper
Carbon Monoxide (CO)	8 hours Average[b] 1 hour[b]	2.0 mg/m^3 4.0 mg/m^3	2.0 mg/m^3 4.0 mg/m^3	• Non Dispersive Infrared Spectroscopy
Ammonia (NH_3)	Annual Average[a] 24 hours Average[b]	100 µg/m^3 400 µg/m^3	100 µg/m^3 400 µg/m^3	• Chemiluminiscence • Indophenol blue method
Benzene (C_6H_6)	Annual Average[a]	5 ng/m^3	5 ng/m^3	• Gas Chromatography continuous analyzer • Adsorption & desorption followed by GC analysis
Benzo(o)pyrene particulate phase only	Annual Average[a]	1 mg/m^3	1 ng/m^3	• Solvent extraction followed by GC/HPLC analysis
Arsenic (As)	Annual Average[a]	6 ng/m^3	6 ng/m^3	• AAS/ICP method after sampling using EPM 2000 or equivalent filter paper
Nickel (Ni)	Annual Average[a]	20 ng/m^3	20 ng/m^3	• AAS/ICP method after sampling using EPM 2000 or equivalent filter paper

(Source: Central Pollution Control Board, New Delhi, Notification dated 18th November 2009)

Notes:

[a] Indicate Annual Arithmetic Mean of Minimum 104 measurement in a year measured twice a week, 24 hourly at uniform intervals

[b] 24 hourly/8 hourly/1 hourly values should be met 98% of the time in a year. However, 2% of the time, it may exceed by not on two consecutive days

Standards for Diesel Generator Sets: Stack Height

The minimum height of stack to be provided with each generator set can be worked out using the following formula:

H = h+0.2x ÖKVA

H = Total height of stack in metre

h = Height of the building in metres where the generator set is installed

KVA = Total generator capacity of the set in KVA

Based on the above formula the minimum stack height to be provided with different range of generator sets may be categorised as follows:

For Generator Sets	Total Height of stack in metre
50 KVA	Height of the building + 1.5 metre
50-100 KVA	Height of the building + 2.0 metre
100-150 KVA	Height of the building + 2.5 metre
150-200 KVA	Height of the building + 3.0 metre
200-250 KVA	Height of the building + 3.5 metre
250-300 KVA	Height of the building + 3.5 metre

Similarly for higher KVA ratings a stack height can be worked out using the above formula.

Noise Standards

Noise limits for domestic appliances and construction equipments at the manufacturing stage in dB(A).

Window air conditioners of 1 -1.5 tonne	68
Air coolers	60
Refrigerators	46
Diesel generator for domestic purposes	85
Compactors (rollers), front loaders, concentrate mixers, cranes (movable), vibrators and saws	75

National Ambient Noise Standards
The Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area	Limit in dB(A) Leq[a]	
		Day Time	Night Time
A.	Industrial area	75	70
B.	Commercial area	65	55
C.	Residential area	55	45
D.	Silence zone	50	40

[a] 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 is an energy mean of the noise level over a specified period.

Notes:

Day time is reckoned in between 6 a.m. and 10 p.m.

Night time is reckoned in between 10 PM and 6 AM.

Silence zone is an area comprising not less than 100 m around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority

Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

APPENDIX 4: FOREST CONSERVATION RULES, 2003
Submission of proposals seeking approval of the Central Government under Section 2 of the Act
Application Forms

As per Rule 6 of the Forest (Conservation) Rules, 2003, every user agency, who wants to use any forest land for non-forest purposes shall make his proposal in the appropriate Form appended to these rules, i.e. Form 'A' for proposals seeking first time approval under the Act and Form 'B' for proposals seeking renewal of leases where approval of the Central Government under the Act had already been obtained earlier, to the concerned nodal officer authorized in this behalf by the State Government, along with requisite information and documents, complete in all respects, well in advance of taking up any non-forest activity on the forest land.

FORM – 'A'
Form for seeking prior approval under section 2 of the proposals by the State Governments and other authorities

PART-I
(to be filled up by user agency)

1. Project details:
   - (i) Short narrative of the proposal and project/scheme for which the forest land is required.
   - (ii) Map showing the required forest land, boundary of adjoining forest on a 1:50,000 scale map.
   - (iii) Cost of the project:
   - (iv) Justification for locating the project in forest area.
   - (v) Cost-benefit analysis (to be enclosed).
   - (vi) Employment likely to be generated.

2. Purpose-wise break-up of the total land required:

3. Details of displacement of people due to the project, if any:
   - (i) Number of families.
   - (ii) Number of Scheduled Castes/Scheduled Tribe families
   - (iii) Rehabilitation plan. (to be enclosed)

4. Whether clearance under Environment (Protection) Act, 1986 required? (Yes/No).

5. Undertaking to bear the cost of raising and maintenance of compensatory afforestation and/or penal compensatory afforestation as well as cost for protection and regeneration of Safety Zone, etc. as per the scheme prepared by the State Government (undertaking to be enclosed).

6. Details of Certificates/documents enclosed as required under the instructions.

Signature
(Name in Block letters)
Designation
Address (of User Agency)

Date:-_____
Place:-_____
State serial No. of proposal_____
(To be filled up by the Nodal Officer with date of receipt)

PART-II
(To be filled by the concerned Deputy Conservator of Forests)
State serial No. of proposal_____

7. Location of the project/Scheme:
- (i) State/Union Territory
- (ii) District.
- (iii) Forest Division
- (iv) (iv). Area of forest land proposed for diversion (in ha.)
- (v) Legal status of forest
- (vi) Density of vegetation.
- (vii) Species-wise (scientific names) and diameter class-wise enumeration of trees (to be enclosed. In case of irrigation / hydel projects enumeration at FRL, FRL-2 meter & FRL-4 meter also to be enclosed.)
- (viii) Brief note on vulnerability of the forest area to erosion.
- (ix) Approximate distance of proposed site for diversion from boundary of forest.
- (x) Whether forms part of National Park, wildlife sanctuary, biosphere reserve, tiger reserve, elephant corridor, etc. (If so, the details of the area and comments of the Chief Wildlife Warden to be
- (xi) annexed).
- (xii) Whether any rare/endangered/unique species of flora and fauna found in the area- if so details thereof.
- (xiii) Whether any protected archaeological/heritage site/defence establishment or any other important monument is located in the area. If so, the details thereof with NOC from competent authority, if required.

8. Whether the requirement of forest land as proposed by the user agency in col. 2 of Part-I is unavoidable and barest minimum for the project. If no, recommended area item-wise with details of alternatives examined.

9. Whether any work in violation of the Act has been carried out (Yes/No). If yes, details of the same including period of work done, action taken on erring officials. Whether work in violation is still in progress.

10. Details of compensatory afforestation scheme:
- (i) Details of non forest area/degraded forest area identified for compensatory afforestation, its distance from adjoining forest, number of patches, size of each patch. 4
- (ii) Map showing non-forest/degraded forest area identified for compensatory afforestation and adjoining forest boundaries.
- (iii) Detailed compensatory afforestation scheme including species to be planted, implementing agency, time schedule, cost structure, etc.
- (iv) Total financial outlay for compensatory afforestation scheme.
- (v) Certificates from competent authority regarding suitability of area identified for compensatory afforestation and from management point of view. (To be signed by the concerned Deputy Conservator of Forests).

11. Site inspection report of the DCF (to be enclosed) especially highlighting facts asked in col. 7 (xi, xii), 8 and 9 above.

12. Division/District profile:

(i) Geographical area of the district.
(ii) Forest area of the district.
(iii) Total forest area diverted since 1980 with number of cases.
(iv) Total compensatory afforestation stipulated in the district/division since 1980 on
(v) forest land including penal compensatory afforestation,
(vi) non-forest land.
(vii) Progress of compensatory afforestation as on (date)_____ on
(viii) forest land
(ix) non-forest land.

13. Specific recommendations of the DCF for acceptance or otherwise of the proposal with reasons.

Signature
Name
Official Seal
Date:-_____
Place:-_____

PART-III
(To be filled by the concerned Conservator of Forests)

14. Whether site, where the forest land involved is located has been inspected by concerned Conservator of Forests (Yes/No). If yes, the date of inspection & observations made in form of inspection note to be enclosed

15. Whether the concerned Conservator of Forests agree with the information given in Part-B and the recommendations of Deputy Conservator of Forests.

16. Specific recommendation of concerned Conservator of Forests for acceptance or otherwise of the proposal with detailed reasons.

Signature
Name
Official Seal
Date:-_____
Place:-_____

PART-IV
(To be filled in by the Nodal Officer or Principal Chief Conservator of Forests or Head of Forest department)

17. Detailed opinion and specific recommendation of the State Forest Department for acceptance of otherwise of the proposal with remarks.

(While giving opinion, the adverse comments made by concerned Conservator of Forests or Deputy Conservator of Forests should be categorically reviewed and critically commented upon).

Signature
Name & Designation
(Official Seal)
Date:-_____
Place:-_____

PART- V
(To be filled in by the Secretary in charge of Forest Department or by any other authorised officer of the State Government not below the rank of an Under Secretary)

18. Recommendation of the State Government:
(Adverse comments made by any officer or authority in Part-B or Part-C or Part-D above should be specifically commented upon)

Signature
Name & Designation
(Official Seal)
Date:-_____
Place:-_____

INSTRUCTIONS (for Part-I):-

1. The project authorities may annex a copy of the approved project/plan in addition to filling Col. 1 (i) e.g. IBM approved mining plan for major minerals/CMPDI plan with subsidence analysis reports, etc.
2. Map has to be in original duly authenticated jointly by project authorities and concerned DCF – Col. 1 (ii).
3. Complete details of alternative alignments examined especially in case of project like roads, transmission lines, railway lines, canals, etc. to be shown on map with details of area of forest land involved in each alternative to be given - Col. 1 (iii).
4. For proposals relating to mining, certificate from competent authority like District Mining Officer about non-availability of the same mineral in surrounding/nearby non-forest areas.
5. In case the same company/individual has taken forest land for similar project in the State, a brief detail of all such approvals/leases be given as an enclosure along with current status of the projects.
6. The latest clarifications issued by the Ministry under Forest (Conservation) Act, 1980 may be kept in mind. In case such information do not fit in the given columns, the same shall be annexed separately.

GENERAL INSTRUCTIONS:-

1. On receipt of proposal, Nodal Officer shall issue a receipt to the user agency indicating therein the name of the proposal, user agency, area in hectare, serial number and date of receipt.
2. If the space provided above is not sufficient to specify any information, please attach separate details/documents.
3. While forwarding the proposal to the Central Government, complete details on all aspects of the case as per Form prescribed above read with the clarifications issued by the Ministry of Environment and Forests, Government of India, New Delhi should be given. Incomplete or

deficient proposals shall not be considered and shall be returned to the State Government in original.

4. The State Government shall submit the proposal to the Central Government within stipulated time limits. In case of delay while forwarding, the reasons for the same to be given in the forwarding/covering letter

FORM – 'B'
(See Rule 6)
Form for seeking prior approval under section 2 of the proposals by the State Governments and other authorities in respect of renewal of leases, which have been earlier granted clearance under Forest (Conservation) Act, 1980

PART-I
(to be filled up by user agency)

1. Letter No. & date vide which clearance under Forest (Conservation) Act, 1980 accorded by the Central Government (copy to be enclosed):

2. Project details:
   (i) Short narrative of the proposal and project/scheme for which the forest land is required.
   (ii) Map showing the required forest land, boundary of adjoining forest on a 1:50,000 scale map.
   (iii) Cost of the project:

3. Purpose-wise break-up of the total land required (already broken & to be broken):

4. Details of Certificates/documents enclosed as required under the instructions.

Signature
(Name in Block letters)
Designation
Address (of User Agency)
Date:-_____
Place:-_____
State serial No. of proposal_____
(To be filled up by the Nodal Officer with date of receipt)

PART-II
(To be filled by the concerned Deputy Conservator of Forests)
State serial No. of proposal_____

5. Location of the project/Scheme:
   (i) State/Union Territory
   (ii) District.
   (iii) Forest Division
   (iv) Area of forest land proposed for diversion (in ha.)
   (v) Legal status of forest
   (vi) Density of vegetation.
   (vii) Species-wise (scientific names) and diameter class-wise enumeration of trees in unbroken area.

(viii) Whether forms part of National Park, wildlife sanctuary, biosphere reserve, tiger reserve, elephant corridor, etc. (If so, the details of the area and comments of the (Chief Wildlife Warden to be annexed).

6. Whether any work in violation of the Act has been carried out (Yes/No). If yes, details of the same including period of work done, action taken on erring officials. Whether work in violation is still in progress.

7. Site inspection report of the DCF (to be enclosed) in respect to status of compliance of conditions stipulated during earlier approval.

8. Division/District profile:

(i) Geographical area of the district.
(ii) Forest area of the district.
(iii) Total forest area diverted since 1980 with number of cases.
(iv) Total compensatory afforestation stipulated in the district/division since 1980 on
(v) forest land including penal compensatory afforestation,
(vi) non-forest land.
(vii) Progress of compensatory afforestation as on (date) _____ on
(viii) forest land
(ix) non-forest land.

9. Specific recommendations of the DCF for acceptance or otherwise of the proposal with reasons.

Signature
Name
Official Seal
Date:-_____
Place:-_____

PART-III

(To be filled by the concerned Conservator of Forests)

10. Whether site, where the forest land involved is located has been inspected by concerned Conservator of Forests (Yes/No). If yes, the date of inspection & observations made in form of inspection note to be enclosed.

11. Whether the concerned Conservator of Forests agree with the information given in Part- B and the recommendations of Deputy Conservator of Forests.

12. Specific recommendation of concerned Conservator of Forests for acceptance or otherwise of the proposal with detailed reasons.

Signature
Name
Official Seal
Date:-_____
Place:-_____

PART-IV
(To be filled in by the Nodal Officer or Principal Chief Conservator of Forests or Head of Forest department)

13. Detailed opinion and specific recommendation of the State Forest Department for acceptance of otherwise of the proposal with remarks.
(While giving opinion, the adverse comments made by concerned Conservator of Forests or Deputy Conservator of Forests should be categorically reviewed and critically commented upon).

Signature
Name & Designation
(Official Seal)
Date:-_____
Place:-_____

PART- V
(To be filled in by the Secretary in charge of Forest Department or by any other authorised officer of the State Government not below the rank of an Under Secretary)

14. Recommendation of the State Government:
(Adverse comments made by any officer or authority in Part-B or Part-C or Part-D above should be specifically commented upon)
Signature
Name & Designation
(Official Seal)
Date:-_____
Place:-_____

INSTRUCTIONS (for Part-I):-
1. The project authorities may annex a copy of the approved project/plan in addition to filling Col. 2 (i) e.g. IBM approved mining plan for major minerals/CMPDI plan with subsidence analysis reports, etc.
2. Map has to be in original duly authenticated jointly by project authorities and concerned DCF – Col. 2 (ii).
3. In case the same company/individual has taken forest land for similar project in the State, a brief detail of all such approvals/leases be given as an enclosure along with current status of the projects.
4. Item-wise requirement (Col. 3) should be separately shown for broken up and fresh areas.
5. The latest clarifications issued by the Ministry under Forest (Conservation) Act, 1980 may be kept in mind. In case such information do not fit in the given columns, the same shall be annexed separately.

GENERAL INSTRUCTIONS:-
1. On receipt of proposal, Nodal Officer shall issue a receipt to the user agency indicating therein the name of the proposal, user agency, area in hectare, serial number and date of receipt.
2. If the space provided above is not sufficient to specify any information, please attach separate details/documents.
3. While forwarding the proposal to the Central Government, complete details on all aspects of the case as per Form prescribed above read with the clarifications issued by the Ministry of

Environment and Forests, Government of India, New Delhi should be given. Incomplete or deficient proposals shall not be considered and shall be returned to the State Government in original.

4. The State Government shall submit the proposal to the Central Government within stipulated time limits. In case of delay while forwarding, the reasons for the same to be given in the forwarding/covering letter

WILD LIFE CLEARANCE FORM
PART – 1
Proposal for investigation and Survey in the National Park / Sanctuary

(Details to be provided by the Applicant)

1. Name of the Organization:

2. Alms and Objectives of the proposed project

3. Location and Map (1:150000 Scale) of the area duly authenticated by the competent authority to be investigated / surveyed

4. Whether investigation / survey requires clearing of vegetation

5. If yes, please specify the extent (in Ha.)

6. Opinion of the Officer In-charge of the N. P. / WLS

7. Opinion of the Chief Wild Life Warden (Attach signed copy). The following be included in the opinion:

(i) Brief history of the protected Area
(ii) Current status of Wildlife
(iii) Projected impacts of projects on wildlife, habitat management and access / use of resource by various stakeholders.
(iv) Contiguous wildlife areas which would benefit wildlife if added to National Park / Sanctuary.
(v) Other areas in the State, which have been recommended by State Government, wildlife Institute of India, BNHS, SACON, IISC, IUCN or other expert body of inclusion in protected Area network.

Signed	**Signed**	**Signed**
Project Head	**The Officer In-charge of the N.P. / WLS**	**The CWLW**
Name	**Office Seal**	**Office Seal**

Date of submission to Govt. of India by the CWLW

PART – II
(To be filled in by the Applicant)

1. Project details:

   (i) Copy of the Investigation and Survey report:
   (ii) (The report should include the dates of survey and the names of the investigators, surveyors and all officials of the concerned NP / WLS who remained present during the period.)
   (iii) Self contained and factual project report for which NP / WLS area is required:
   (iv) Map (Duly authenticated by the Divisional / District Head of the Department dealing With Forests and Wild Life) on a scale of 1:150000 showing the boundaries of the NP / WLS, delineating the area in question in red color.)
   (v) Self contained and factual report of at least two alternatives considered by the project authorities along with technical and financial justification for opting national park / sanctuary area.
   (vi) Copy of the Bio Diversity Impact Assessment report in case the proposal involves diversion if more the 50 ha. NP / WLS area

2. Location of the project / scheme

   (i) State / Union Territory:
   (ii) District:
   (iii) Name of the National Park / Sanctuary:

3. Details of the area required (in Hectares only)

(Provide break-up of the land use under the project e.g., construction of dam, submergence, housing for staff, read etc.)

4. Details of displacement of people, if any, due to the project:

   (i) Total number of families involved in displacement:
   (ii) Number of Scheduled Caste / Scheduled Tribe families involved in displacement:
   (iii) Detailed rehabilitation plan:

5. Any other information relevant to the proposal but not covered in any of the columns above.

Project Head:
Name:
Organization:
Date of submission to the Head of the National Park / Sanctuary:

PART – III

(To be completed by the Officer-in-Charge of the National Park / Sanctuary completed and submitted to the Chief Wild Life Warden or officer authorized by him in this behalf within 30 days of the receipt of Part-II)

1.	Date of receipt of the part-II	
2.	Total Area (Ha.) of National Park / Sanctuary	
3.	Total area (Ha.) diverted from the NP / WLS so far for Development purposes	
4.	List the past projects and the are (Ha.) diverted Name of Project Area diverted Year of diversion	
5.	Positive impact/s due to the diversion of area for the Projects Referred to in column 4 above Name of the Project/s Positive impact Scientific Basis of Assessment (Attach separate document, if required)	
6.	Negative Impact/s due to the diversion of area for the projects Referred to in column 4 above Name of the Project/s Negative impact Scientific Basis of Assessment (Attach separate document, if required)	
7.	Management Plan Period Attach copy of the Management Plan / Management Scheme / Recommendation of Chief Wildlife Warden.	
8.	List Management actions taken / proposed to be taken in the Whole Block / Zone in which the proposed area is located.	
9.	Type of forest in which the proposed area fails.	
10.	Location of the proposed area with respect to the critical / intensive Wildlife management areas / wildlife habitats. (Attach map to Scale)	
11.	List the likely POSITIVE AND NEGATIVE impact/s of the proposed project giving scientific and Technical justification for each impact.	
12.	Provide COMPREHENSIVE details of the impact of the proposal in terms of Sections 29 and / or Section 35 (6) of the Wild Life (Protection) Act, 1972 as the case may be.	
13.	Whether the project authorities have ever committed violation of the wild life (Protection) Act, 1972 or Forest Conservation Act, 1980. If yes, provide the EXHAUSTIVE details of the offence and the present status of the case.(Concealing or misrepresenting the facts will lead to refection o the case in addition to any other penalty as prescribed under Law)	
14.	Have you examined the Project Appraisal document and the alternatives as provided in Part-II.	
15.	Have you examined the Bio Diversity Impact Assessment Report.	
16.	If yes, please give your comments on the recommendations given in the report.	
17.	Dates and duration of yours field visits to the proposed site.	
18.	Do you agree that the present proposal of diversion of NP / WLS area is the best or only option and is viable.	
19.	Any other information that ;you would bring to the notice of the State Board, National Board or its Committee that may be relevant and assist in decision making.	
20.	Do you recommend the project. *(Please provide full justification to support your recommendations)*	

Signed by

The Officer In-charge of the N.P. / WLS
Office Seal

Date of submission to the Chief Wild Life Warden or any other officer authorized by him in this regards.

PART-IV
(To be completed by the Chief Wildlife Warden within 15 days of the receipt of Part-II and III)

1. Date of RECEIPT of part-II and III by the Chief Wildlife Warden or the officer authorized by him in this regard.

2. Do you agree with the information and recommendations provided by the Officer-in-Charge in Part-III

3. If not, please provide the reasons.

4. Have you visited the site you self and held discussions with the applicant.

5. Do you agree that the present proposal for permitting use of NP / WLS area is the best option of only option and is viable.

6. Please provide specific comments w.r.t. Section 29 of the Wildlife (Protection) Act, 1972.

7. Any other information that you would bring to the notice of the State Board, National Board or its Committee that may be relevant and assist in decision making.

8. Do you recommend the project.

(Please provide full justification to support your recommendations)

9. Conditions, if any, to be ensured in the interest of wildlife for allowing use of the area.

Signed by
The Chief Wildlife Warden

Name

State

Official Seal

Date of submission to the State Government

PART-V
(To be completed by the Department of Charge of Forestry and Wildlife in consultation with the State Board for Wildlife within 30 days of the receipt of Part-II, III and IV)

Date of RECEIPT of PART II, III and IV by the Department.

1. Do you agree with the recommendation/s of the Chief Wildlife Warden.

2. If not, please provide the reasons.

3. Did you provide Part II, III and IV to the members of the State Board for Wildlife.

4. Attach copy of the opinion of the State Board for Wildlife.

5. Give details of the recommendations of the State Government.

Signed by

The Principal Secretary

Name

State

Official Seal

Date of submission to the Central Government

PART-VI
(To be placed by the Member Secretary, Standing Committee of National Beard in the subsequent meeting of the Standing Committee)

Guidelines for Site Inspection by the Expert Committee of NBWL

1. Site inspections, if required, shall be completed within the inter sectional period of the two consecutive meetings.

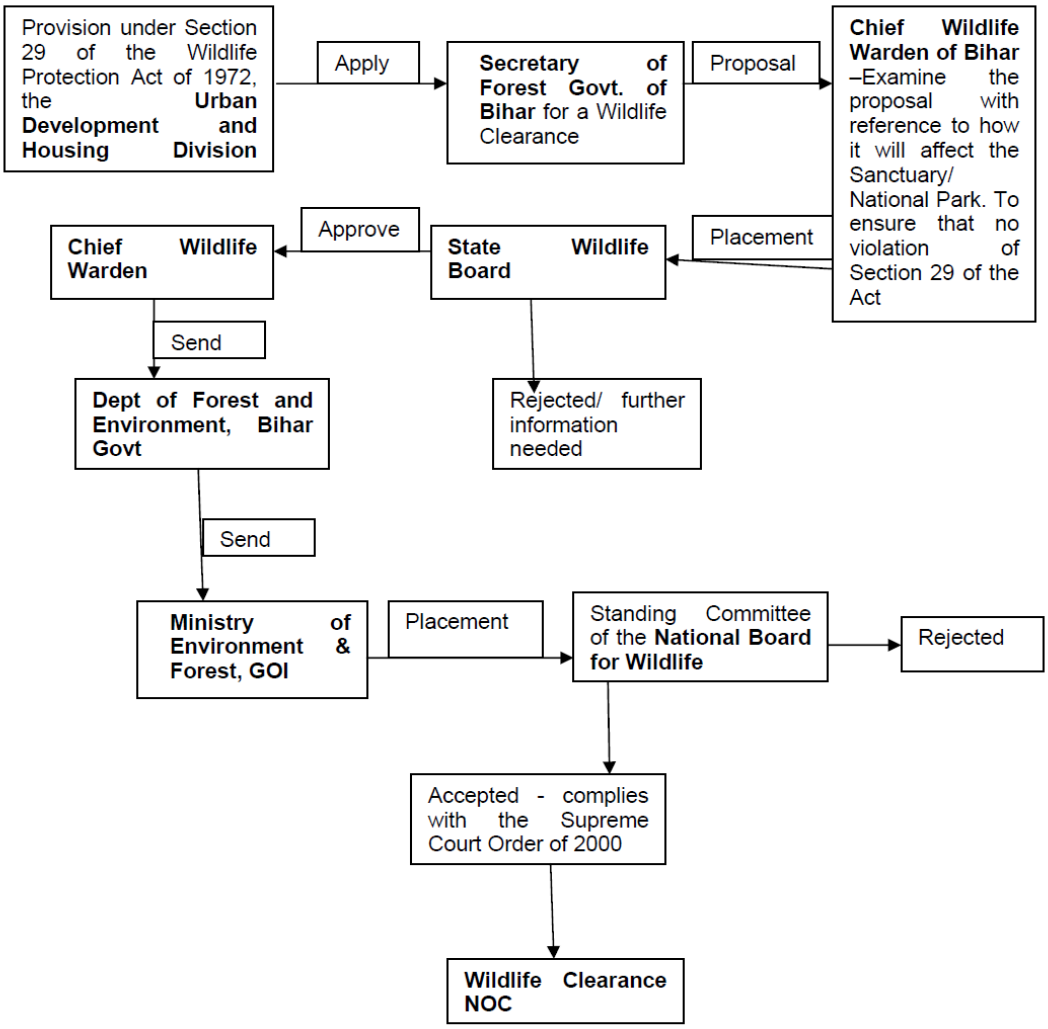
2. The applicant will deposit a processing fee for with the NBWL Secretariat. The processing fee will be utilized for providing secretarial assistance to the members, coordinating their program, meeting the travel and stay cost of inspection team, Biodiversity Impact assessment and related issues. The Standing committee shall decide the amou8nmt will be refunded to the applicant along with the details of expenditure.

3. Chairperson of the Standing Committee may include other members of the Board for site inspection at his discretion.

4. Site inspections will not be required for proposal where Bio- diversity Impact Assessment has been carried out.

5. In case the project is of critical nature and cannot be delayed that the opinion of the members of the Standing Committee shall be taken by circulation.

APPENDIX 5: PROCEDURE FOR APPLICATION FOR WILDLIFE CLEARANCE



Source: Government of India, Ministry of Environment and Forest Order No. J-11013/41/2006-IA.II(I)

APPENDIX 6: PROJECT COMPONENTS IN SUBSEQUENT TRANCHES

Town/ City	Sub-projects	Main components (New or Refurbished)
Bhagalpur	Water Supply	• Construction of one intake • Construction of one WTP
Muzaffarpur	Sewerage and Sanitation	• Laying of primary and trunk sewers including construction of manholes, restoration of roads, laying sewer by trenchless technology; Primary/trunk sewer: Secondary and Tertiary sewers sewer 160-1400 mm dia. approx. 266 km • Construction of Sewage PS and sewage pumping main: Intermediate PS: 9 no, Main PS : 1 no • Design, supply, construction, testing & commissioning of 43 mld STP by extended aeration process including O&M for 5 years • House connection & construction of chambers • Procurement of suction cum jetting machine
Darbhanga	Water Supply	• Supply and installation of 4 nos. of Tube wells including supply and installation of pumps, motors and all mechanical and electrical components, testing and commissioning complete • Construction of 1 no. intake well in the river Baghmati including supply installation of pumps, motors and all mechanical and electrical components complete • Supplying and laying 1000 mm dia. MS raw water pumping main (approx. 24 km) with appurtenances (Intake well to WTP) including testing and commissioning • Design, supply, Construction, testing & commissioning of 60 mld capacity water treatment plant with Clear water pumping station including O&M for 5 years • Construction of 11 RCC overhead tanks of total 6 ML capacity • Laying of Clear water main - 500 mm-30 km / 300 mm-3 km • Laying of Distribution lines 110-400 mm dia - 76 km • Supplying and fixing domestic water meters (approx. 33,000) in house connections including testing and commissioning complete
Gaya	Water Supply	• Redevelopment of 17 nos. Tube Wells • Construction of 2 nos. of intake wells in the river Ganga including supply installation of pumps, motors, raw water transmission pipe and all mechanical and electrical components complete. • Design, supply, Construction, testing & commissioning of 165 mld capacity water treatment plant with Clear water pumping station including O&M for 5 years • Supplying and laying 1400 mm dia. 94 km approx. transmission main from WTP at Fatwa to Main Reservoir-1 at Gaya with appurtenances including testing and commissioning complete • Supplying and laying 1200 mm dia. 106 km transmission main from WTP at Fatwa to Main Reservoir-2 at Gaya with appurtenances including testing and commissioning complete • Construction of 2 nos. RCC main balancing reservoirs of 12 ML total capacity, including chlorination system, roads & building complete • Construction of 17 nos. RCC overhead tanks of total 15 ML capacity • Supplying and laying pipes with appurtenances for transmission and distribution system at different Zones including testing & commissioning complete- 110-600 mm dia. Approx. 359 km • Supplying and fixing domestic water meters (approx. 54500 nos.) in house connections including testing and commissioning complete
Darbhanga	Sewerage and Sanitation (Stand by)	• Supplying and laying sewers including construction of manhole chambers, Inspection pits, house connections and restoration of roads and drains of different zones • Construction of Intermediate Sewage Pumping Stations and pumping main • Design, supply, Construction, testing & commissioning of 34 mld capacity treatment plant including O&M for 5 years sewage

Town/ City	Sub-projects	Main components (New or Refurbished)
		• Procurement of 4 nos. suction cum jetting machine
Gaya	Sewerage and Sanitation (Stand by)	• Supplying and laying sewers including construction of manhole chambers, Inspection pits, house connections and restoration of roads and drains of different zones • Construction of Intermediate Sewage Pumping Stations and pumping main • Design, supply, Construction, testing & commissioning of 54 mld capacity treatment plant including O&M for 5 years sewage • Procurement of 4 nos. suction cum jetting machine

mld = Million Letter per Day, WTP = Water Treatment Plant, STP = Sewage Treatment Plant, MS = Mild Steel, DI = Ductile Iron, RCC = Reinforcement Cement Concrete, O&M = operation and maintenance

APPENDIX 7: ENVIRONMENTAL IMPACT MATRIX

Water Supply Subproject

Field	Anticipated Impact	Mitigation Measures
Pre-construction / Design Phase		
Environmental clearances	CFE and CFO are required from the BSPCB in order to implement the project particularly construction of Water Treatment Plant	Pursue all clearances and follow up with relevant authorities
Water Supply	Health risk due to closure of water supply	• Plan the construction program to keep the cessation of water supplies to the minimum possible • In coordination with line agency, provide alternative potable water to affected households and businesses for the duration of the shut-down; and • Liaise with affected persons to inform them of any cessation in advance
Utilities	Impact/ shifting of telephone lines, electric poles and wires, water lines within proposed project area	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and • Require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.
Social and Cultural Resources	Ground disturbance can uncover and damage archaeological and historical remains	• Consult Archaeological Survey of India (ASI) or concerned dept. of Govt. of Bihar to obtain an expert assessment of the archaeological potential of the site; • Consider alternatives if the site is found to be of medium or high risk; • Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognised and measures are taken to ensure they are protected and conserved.
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Disruption to traffic flow and sensitive receptors	• Prioritize areas within or nearest possible vacant space in the subproject location without destruction of property, vegetation, irrigation, and drinking water supply systems • Avoid residential areas; and • Avoid direct disposal of waste/ effluent to water body which will inconvenience the community.
Construction Phase		
Sources of Materials	Extraction of rocks and material may cause ground instability	• Use quarry sites and sources permitted by government; • Verify suitability of all material sources and obtain approval of Project Implementation Authority
Air Quality	Emissions from construction vehicles, equipment, and machinery used for excavation and construction resulting to dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons	• Consultation with PMU/ PIU on the designated areas for stockpiling of clay, soils, gravel, and other construction materials; • Damp down exposed soil and any stockpiled on site by spraying with water when necessary during dry weather; • Use tarpaulins to cover sand and other loose material when transported by trucks; and • Fit all heavy equipment and machinery with air pollution control devices which are operating correctly. • Carry out air quality monitoring as per Environmental Management Plan (EMP)
Surface water quality	Mobilization of settled silt materials, run-off from stockpiled materials,	• Avoid stockpiling of earth fill especially during the monsoon season unless covered by

Field	Anticipated Impact	Mitigation Measures
	and chemical contamination from fuels and lubricants during construction works can contaminate nearby surface water quality.	tarpaulins or plastic sheets; • Prioritize re-use of excess spoils and materials in the construction works. • 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; • Dispose any wastes generated by construction activities in designated sites; and • Conduct surface quality inspection according to the Environmental Management Plan (EMP).
Noise Levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people	• Plan activities in consultation with PIU/ DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; • Require horns not be used unless it is necessary • Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street 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.
Waste water (i.e. extracted ground water during re-development)	Improper disposal of waste water causing water pollution	▪ Adequate arrangement shall be made for disposal of waste-water during development of tube well so that it is discharged in nearest *Nala/*drain.
Generated Muck	Improper disposal of muck causing environmental pollution	▪ The muck generated due to excavations/ tube well sinking, etc. shall be disposed off at selected site approved by the engineer.
Ecological resources	Felling of the trees – affect terrestrial ecological balance and affect aquatic fauna	• Not to dispose any construction materials in river which may pollute the river water and impact on aquatic fauna, • Planning on arrangement of net at water intake point so that it will not affect the Dolphin habitation/movement (In case of Bhagalpur), • Consultation with Dolphin expert during implementation stage is absolutely required for the protection of endangered species, • Minimize removal of vegetation and disallow cutting of trees; • If tree-removal will be required, obtain tree-cutting permit from Municipality, • Require to plant three (3) native trees for every one (1) that is removed; and • Prohibit employees from poaching wildlife, bird hunting, and cutting of trees for firewood.
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure at specified project location	• Obtain from PIU/ DSC the list of affected utilities and operators if any; and • Prepare a contingency plan to include actions to be done in case of unintentional interruption of service
Landscape and Aesthetics	Solid wastes as well as excess construction materials	• Prepare and implement Waste Management Plan; • Avoid stockpiling of excess excavated soils;

Field	Anticipated Impact	Mitigation Measures
		• Use tarpaulins to cover dry soil when carried on trucks; • Coordinate with ULB for beneficial uses of excess excavated soils or immediately dispose to designated areas; • Recover used oil and lubricants and reuse or remove from the sites; • Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; • Remove all wreckage, rubbish; and • Timely restoration work
Accessibility	Traffic problems and conflicts near project locations and haul road	• Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites; • Schedule transport and hauling activities during non-peak hours; • Locate entry and exit points in areas where there is low potential for traffic congestion; • Keep the site free from all unnecessary obstructions; • Drive vehicles in a considerate manner; • Coordinate with Traffic Dept. for temporary road diversions and with for provision of traffic aids if transportation activities cannot be avoided during peak hours; and • Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.
Socio-Economic – Income.	Impede the access of residents and customers to nearby shops	• Leave spaces for access between mounds of soil; • Provide walkways and metal sheets where required for people and vehicles; • Increase workforce in front of critical receptors such as institutions, place of worship, business establishment, hospitals, and schools; • Consult businesses and institutions regarding operating hours and factoring this in work schedules; and • Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.
Socio-Economic - Employment	Generation of contractual employment and increase in local revenue	• Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; and • Secure construction materials from local market.
Occupational Health and Safety	Occupational hazards which can arise during work	• Develop and implement site-specific Health and Safety Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use Personal Protective Equipment (PPE); (c) health and safety training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; • Ensure availability of First-aid box and equipment at working sites; • Provide medical insurance coverage for

Field	Anticipated Impact	Mitigation Measures
		workers; • Provide supplies of potable drinking water; • Provide clean eating areas where workers are not exposed to hazardous or noxious substances; • Provide health and safety orientation training (including process of transmission of HIV/AIDS) to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; • Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; • Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and • Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection.
Asbestos Cement Pipes	Health risk	• Train all personnel (including manual labourers) to enable them to understand the dangers of asbestos cement pipes and to be able to recognise them in situ; • Report to management immediately if asbestos cement pipes are encountered; • Develop and apply asbestos cement Management Plan.
Community Health and Safety.	Traffic accidents and vehicle collision with pedestrians during material and waste transportation	• Plan routes to avoid times of peak-pedestrian activities. • Liaise with PIU/DSC in identifying high-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. • Use of caution tape, safety ribbon at excavated area
Work Camps	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants	• Consult with PMU before locating project offices, sheds, and construction plants; • Minimize removal of vegetation and disallow cutting of trees; • Provide water and sanitation facilities for employees; • Prohibit employees from poaching wildlife and cutting of trees for firewood; • Train employees in the storage and handling of materials which can potentially cause

Field	Anticipated Impact	Mitigation Measures
		soil contamination; • 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; • Remove all wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and • Ensure restoration of camp site to pre-project conditions just after completion of work.
Social and Cultural Resources	Risk of archaeological chance finds Sites of social/cultural importance (schools, hospitals, religious place, tourism sites) may be disturbed by noise, dust, vibration and impeded access Trenching on concrete roads using pneumatic drills will cause noise and air pollution	• Strictly follow the protocol for chance finds in any excavation work; • Request PIU or any authorized person with archaeological field training to observe excavation; • Stop work immediately to allow further investigation if any finds are suspected; and • Inform project implementation authority if a find is suspected, and take any action they require ensuring its removal or protection in situ. • Avoid any impact on sensitive receptors through selection of alternative alignments/ locations • Identify buildings at risk from vibration damage and avoid using pneumatic drills or heavy vehicles nearby • Provide alternative walkways and maintaining safety
Clean-up Operations, Restoration and Rehabilitation	Social obligation	▪ The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. ▪ The contractor will clear all temporary structures (and structure which need to be remove) ▪ All construction zones used/affected by the project will be left clean and tidy, at the contractor's expense, to the entire satisfaction to the Supervisor Engineer.
Operation Phase		
Occupational Health and Safety	Adverse impacts on the appearance of surrounding environment and exposure of workers to hazardous debris	• Ensure persons employed will be provided with suitable equipment (such as shovels and wheelbarrows); and • Ensure all removed material will be deposited in the municipal waste storage bins.
General	General impact	• Refill and re-compact trenches soil and backfilled sand will be removed to expose the leaking junction or pipe; • Conduct work during non-monsoon period; and • Cover or wet excavated material to prevent dusts
Solid Wastes-Sludge	Environmental pollution - Potential impact on soil, groundwater, and surface water nearby the disposal site	• Minimize the quantity of solids generated by the water treatment process; • Disposal of sludge as per recommendation of regulatory authority; • Disposal of lime sludge by land application, • Limiting application rates of sludge to minimize the potential for mobilization of metals into plant tissue and groundwater,

Field	Anticipated Impact	Mitigation Measures
		• Disposal of ferric and alum sludge by controlled land application not near water body, • Testing of sludge before disposal
Wastewater	Discharge into water causing water pollution	• Land application of wastes with high dissolved solids concentrations; • Recycle filter backwash into the process; and • Treat and dispose of reject streams as per CPHEEO norm
Hazardous Chemicals	Release to nature causing air, water and soil pollution	• Store sodium/calcium hypochlorite in cool, dry, and dark conditions for no more than one month, • Use equipment constructed of corrosion-resistant materials, • Store calcium hypochlorite away from any organic materials and protect from moisture, • Isolate ammonia storage and feed areas from hypochlorite, • Minimize the amount of chlorination chemicals stored on site, • Develop and implement a prevention program that includes identification of potential hazards, written operating procedures, training, maintenance, and accident investigation procedures; • Develop emergency plan for responding to accidental releases
Air Emissions	Air pollution from gaseous or volatile chemicals used for disinfection processes	Proper storage and scientific utilization of chemicals utilized in treatment process
Economic Development	Impediments to residents and businesses	• Inform all residents and businesses about the nature and duration of any work well in advance so that they can make preparations if necessary; • Conduct these works to provide wooden walkways across trenches for pedestrians and metal sheets where vehicle access is required; and • Consult the local police regarding any such work so that it can be planned to avoid traffic disruption as far as possible, and road diversions can be organised if necessary.
Social and Cultural Resources	Temporary disruption of activities	• Consult the city authorities to identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity; • Complete work in sensitive areas quickly; • Consult municipal authorities, custodians of important buildings, cultural and tourism authorities and local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals.
Supply of treated water	Health Impact	• Continue testing of supply water quality as per drinking water standard.

CFE: Consent for Establishment, CFO: Consent for Operation, BSPCB: Bihar State Pollution Control Board, EMP: Environmental Management Plan, ASI: Archaeological Survey of India, PPE: Personal Protective Equipment, PMU: Project Management Unit, PIU: Project Implementation Unit, DSC: Design & Supervision Consultant, PMC: Project Management Consultant, CPHEEO: Central Public Health and Environmental Engineering Organization, ULB: Urban Local Body, dB(A): Decibel, HIV: Human immunodeficiency virus, AIDS: Acquired immune deficiency syndrome,

Sewerage and Sanitation Subprojects

Field	Anticipated Impact	Mitigation Measures
Preconstruction / Design Phase		
Environmental clearances	CFE and CFO are required from the BSPCB in order to implement the project particularly construction of Sewage Treatment Plant	Pursue all clearances and follow up with relevant authorities
Land for STP	Land use impact, conversion of present agricultural land to sewage treatment area	Mitigation of affected person as per Resettlement policy (in case of Muzaffarpur)
Utilities	Impact/ shifting of telephone lines, electric poles and wires, water lines within proposed project area	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and • Require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.
Social and Cultural Resources	Ground disturbance can uncover and damage archaeological and historical remains	• Consult Archaeological Survey of India (ASI) or concerned dept. of Govt. of Bihar to obtain an expert assessment of the archaeological potential of the site; • Consider alternatives if the site is found to be of medium or high risk; • Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognised and measures are taken to ensure they are protected and conserved.
Waste water	Land pollution due to improper discharge of treated effluent	• Provision (within detail project report) on reuse of waste water for irrigation purpose or recirculation
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Disruption to traffic flow and sensitive receptors	• Prioritize areas within or nearest possible vacant space in the subproject location without destruction of property, vegetation, irrigation, and drinking water supply systems • Avoid residential areas; and • Avoid direct disposal of waste/ effluent to water body which will inconvenience the community.
Construction Phase		
Sources of Materials	Extraction of rocks and material may cause ground instability	• Use quarry sites and sources permitted by government; • Verify suitability of all material sources and obtain approval of Project Implementation Authority
Air Quality	Emissions from construction vehicles, equipment, and machinery used for excavation and construction resulting to dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons	• Consultation with PMU/ PIU on the designated areas for stockpiling of clay, soils, gravel, and other construction materials; • Damp down exposed soil and any stockpiled on site by spraying with water when necessary during dry weather; • Use tarpaulins to cover sand and other loose material when transported by trucks; and • Fit all heavy equipment and machinery with air pollution control devices which are operating correctly. • Carry out air quality monitoring as per Environmental Management Plan (EMP)
Surface water quality	Mobilization of settled silt materials, run-off from stockpiled materials, and chemical contamination from fuels and lubricants during	• Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; • Prioritize re-use of excess spoils and

Field	Anticipated Impact	Mitigation Measures
	construction works can contaminate nearby surface water quality.	materials in the construction works. • 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; • Dispose any wastes generated by construction activities in designated sites; and • Conduct surface quality inspection according to the Environmental Management Plan (EMP).
Noise Levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people	• Plan activities in consultation with PIU/ DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; • Require horns not be used unless it is necessary • Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street 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.
Ecological resources	Felling of the trees – affect terrestrial ecological balance and affect aquatic fauna	• Not to dispose any construction materials on water body • Minimize removal of vegetation and disallow cutting of trees; • If tree-removal will be required, obtain tree-cutting permit from Municipality, • Require to plant three (3) native trees for every one (1) that is removed; and • Prohibit employees from poaching wildlife, bird hunting, and cutting of trees for firewood.
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure at specified project location	• Obtain from PIU/ DSC the list of affected utilities and operators if any; • Prepare a contingency plan to include actions to be done in case of unintentional interruption of service
Landscape and Aesthetics	Solid wastes as well as excess construction materials	• Prepare and implement Waste Management Plan; • Avoid stockpiling of excess excavated soils; • Use tarpaulins to cover dry soil when carried on trucks; • Coordinate with ULB for beneficial uses of excess excavated soils or immediately dispose to designated areas; • Recover used oil and lubricants and reuse or remove from the sites; • Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; • Remove all wreckage, rubbish; and • Timely restoration work
Accessibility	Traffic problems and conflicts near project locations and haul road	• Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;

Field	Anticipated Impact	Mitigation Measures
		• Schedule transport and hauling activities during non-peak hours; • Locate entry and exit points in areas where there is low potential for traffic congestion; • Keep the site free from all unnecessary obstructions; • Drive vehicles in a considerate manner; • Coordinate with Traffic Dept. for temporary road diversions and with for provision of traffic aids if transportation activities cannot be avoided during peak hours; and • Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.
Socio-Economic – Income.	Impede the access of residents and customers to nearby shops	• Leave spaces for access between mounds of soil; • Provide walkways and metal sheets where required for people and vehicles; • Increase workforce in front of critical receptors such as institutions, place of worship, business establishment, hospitals, and schools; • Consult businesses and institutions regarding operating hours and factoring this in work schedules; and • Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.
Socio-Economic - Employment	Generation of contractual employment and increase in local revenue	• Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; and • Secure construction materials from local market.
Occupational Health and Safety	Occupational hazards which can arise during work	• Develop and implement site-specific Health and Safety Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use Personal Protective Equipment (PPE); (c) health and safety Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; • Ensure availability of First-aid box and equipment at working sites; • Provide medical insurance coverage for workers; • Provide supplies of potable drinking water; • Provide clean eating areas where workers are not exposed to hazardous or noxious substances; • Provide health and safety orientation training (including process of transmission of HIV/AIDS) to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; • Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;

Field	Anticipated Impact	Mitigation Measures
		• Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; • Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and • Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection.
Asbestos Cement Pipes	Health risk	• Train all personnel (including manual labourers) to enable them to understand the dangers of asbestos cement pipes and to be able to recognise them in situ; • Report to management immediately if asbestos cement pipes are encountered; • Develop and apply asbestos cement Management Plan.
Community Health and Safety.	Traffic accidents and vehicle collision with pedestrians during material and waste transportation	• Plan routes to avoid times of peak-pedestrian activities. • Liaise with PIU/DSC in identifying high-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. • Use of caution tape, safety ribbon at excavated area
Work Camps	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants	• Consult with PMU before locating project offices, sheds, and construction plants; • Minimize removal of vegetation and disallow cutting of trees; • Provide water and sanitation facilities for employees; • Prohibit employees from poaching wildlife and cutting of trees for firewood; • Train employees in the storage and handling of materials which can potentially cause soil contamination; • 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; • Remove all wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and • Ensure restoration of camp site to pre-project conditions just after completion of work.
Social and Cultural Resources	Risk of archaeological chance finds Sites of social/cultural importance (schools, hospitals, religious place, tourism sites) may be disturbed by noise, dust, vibration and impeded	• Strictly follow the protocol for chance finds in any excavation work; • Request PIU or any authorized person with archaeological field training to observe excavation;

Field	Anticipated Impact	Mitigation Measures
	access Trenching on concrete roads using pneumatic drills will cause noise and air pollution	• Stop work immediately to allow further investigation if any finds are suspected; and • Inform project implementation authority if a find is suspected, and take any action they require ensuring its removal or protection in situ. • Avoid any impact on sensitive receptors through selection of alternative alignments/ locations • Identify buildings at risk from vibration damage and avoid using pneumatic drills or heavy vehicles nearby • Provide alternative walkways and maintaining safety
Clean-up Operations, Restoration and Rehabilitation	Social obligation	▪ The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. ▪ The contractor will clear all temporary structures (and structure which need to be remove) ▪ All construction zones used/affected by the project will be left clean and tidy, at the contractor's expense, to the entire satisfaction to the Supervisor Engineer.
Operation Phase		
Waste Water Quality	Deterioration of surface and groundwater quality	Ensure treated waste water complies with the government's Standards for Discharges to Inland Waters and Land for Irrigation
Occupational Health and Safety	Adverse impacts on the appearance of surrounding environment and exposure of workers to hazardous debris and gases from sewage pipeline	• Ensure persons employed will be provided with suitable equipment (such as shovels and wheelbarrows); and • Ensure all removed material will be deposited in the municipal waste storage bins. • Arrangement of oxygen and PPE for labourer during repairing work • Train all personnel (including manual labourer) to enable them to understand the dangers of asbestos cement pipes and to be able to recognise them in situ; • Report to management immediately if asbestos cement pipes are encountered; and • Develop and apply asbestos cement Management Plan.
General maintenance	May cause disturbance to sensitive receptors, dusts, increase in noise level	• Refill and re-compact trenches soil and backfilled sand will be removed to expose the leaking junction or pipe; • Conduct work during non-monsoon period; and • Cover or wet excavated material to prevent dusts.
Solid Wastes-Sludge	Environmental pollution - Potential impact on soil, groundwater, and surface water nearby the disposal site	• Disposal of sludge as per recommendation of regulatory authority; • Testing of sludge before disposal
Economic Development	Impediments to residents and businesses	• Inform all residents and businesses about the nature and duration of any work well in advance so that they can make preparations if necessary; • Conduct these works to provide wooden walkways across trenches for pedestrians and metal sheets where vehicle access is required; and • Consult the local police regarding any such work so that it can be planned to avoid traffic

Field	Anticipated Impact	Mitigation Measures
		disruption as far as possible, and road diversions can be organised if necessary. • Supply of sewage sludge from Sewage Treatment Plant (STP) to farmers for use in farming – economic development through utilization of waste material
Social and Cultural Resources	Temporary disruption of activities	• Consult the city authorities to identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity; • Complete work in sensitive areas quickly; • Consult municipal authorities, custodians of important buildings, cultural and tourism authorities and local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals.

CFE: Consent for Establishment, CFO: Consent for Operation, BSPCB: Bihar State Pollution Control Board, EMP: Environmental Management Plan, ASI: Archaeological Survey of India, PPE: Personal Protective Equipment, PMU: Project Management Unit, PIU: Project Implementation Unit, DSC: Design & Supervision Consultant, PMC: Project Management Consultant, CPHEEO: Central Public Health and Environmental Engineering Organization, ULB: Urban Local Body, dB(A): Decibel, HIV: Human immunodeficiency virus, AIDS: Acquired immune deficiency syndrome,

Note: During designing time PIU, PMU, and PMC are involved to check the provision of mitigation measures and take necessary action to comply the requirement. During construction stage, implementation of mitigation measures is the construction contractor's responsibility while during operation stage, ULB or Line Agency will be responsible for maintenance or repair works.

APPENDIX 8: ADB'S ENVIRONMENT POLICY – SAFEGUARD POLICY STATEMENT (2009) SUMMARY

Summary of principal process under SPS (2009) are described below.

A. Environmental Classification

1. *Screening and Categorization:* ADB will carry out project screening and categorization at the earliest stage of project preparation when sufficient information is available for this purpose. Screening and categorization is undertaken to (i) reflect the significance of potential impacts or risks that a project might present; (ii) identify the level of assessment and institutional resources required for the safeguard measures; and (iii) determine disclosure requirements.

2. *Environment Categorization:* ADB uses a classification system to reflect the significance of a project's potential environmental impacts. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. Each proposed project is scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts.

3. According to ADB Environment Policy the environmental classification of subprojects is determined by the Environment and Social Safeguards Division (ESSD) of ADB through category identification format and Rapid Environmental Assessment Checklist, which are shown in **(Appendix VIII).** Projects are assigned to one of the following four categories:

(i) **Category A.** Sub-project components that are projected to have potentially significant adverse environmental impacts. An environmental impact assessment (EIA) is required;
(ii) **Category B.** Sub-project components that are projected to have some adverse environmental impacts, but they are expected to be less significant than those associated with category A projects. An IEE is required to determine whether an EIA is warranted. If an EIA is not needed, the IEE is regarded as the final environmental assessment report; and
(iii) **Category C.** Sub-project components that are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are still reviewed.
(iv) **Category FI.** A proposed project is classified as category FI if it involves investment of ADB funds to or through a FI

4. The classification of a project is reviewed on completion of the studies and may be revised if appropriate by ADB's Chief Compliance Officer.

B. Preparation of Initial Environmental Examinations (IEEs)

5. An IEE is conducted if the sub-project is likely to have minimal impacts, which can be easily predicted and evaluated, and for which mitigation measures prescribed easily. IEE study is also used to confirm whether the subproject requires an Environmental Impact Assessment (EIA) to evaluate and/or mitigate negative environmental impacts. IEEs generally rely on secondary sources of data and information, and in general no specific field surveys are conducted to establish the baseline environmental profile. Each Category B sub-project under

BUDP requires an IEE. The content and format of the IEE is shown in Safeguard Policy Statement (SPS) 2009 of ADB**.**

C. Preparation of Environmental Impact Assessments (EIAs)

6. Given the sub-project selection criteria prescribed in the above table it is most unlikely that subprojects prepared for funding under BUDP is classified as Category A, requiring an EIA. An EIA fulfils the same purpose as an IEE, but requires an in-depth analysis because of the potential significance of environmental impacts from the project. An EIA requires: comprehensive analysis of the potential impacts; works to be carried out to formulate practical mitigation measures; in-depth economic evaluation of impact to screen and evaluate the best alternative; and an in-depth analysis to prepare an environmental management plan. The content and format of the EIA is shown in Safeguard Policy Statement (SPS) 2009 of ADB**.**

D. Environmental Management and Monitoring Plans (EMPs)

7. ADB requires that an EMP must be developed as part of the EIAs for category A, and IEEs of Category B projects. EMPs describe the environmental management measures that will be carried out to mitigate negative impacts or enhance the environment during implementation of a project, and the environmental monitoring to be conducted to ensure that mitigation is provided and is effective in reducing impacts, or to determine the long-term impacts of a project. EMPs for Category A and B subprojects should outline specific mitigation measures, environmental monitoring requirements, and related institutional arrangements, including budget requirements. The preparation and content of EMP is given in ADB Environmental Assessment Guidelines, 2003.

8. The EMP will include the proposed mitigation measures, environmental monitoring and reporting requirements, emergency response procedures, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Where impacts and risks cannot be avoided or prevented, mitigation measures and actions will be identified so that the project is designed, constructed, and operated in compliance with applicable laws and regulations and meets the requirements specified in this document. The level of detail and complexity of the environmental planning documents and the priority of the identified measures and actions will be commensurate with the project'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.

9. 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.

E. Consultation and Participation and Grievance Redress Mechanism

10. Project Authority will carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. Meaningful consultation is a process that (i) begins early in the project preparation stage and is

carried out on an ongoing basis throughout the project cycle;1 (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues. Consultation will be carried out in a manner commensurate with the impacts on affected communities. The consultation process and its results are to be documented and reflected in the environmental assessment report.

11. The project authority will establish a mechanism to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the project's environmental performance. The grievance mechanism should be scaled to the risks and adverse impacts of the project. It should address affected people's concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the affected people at no costs and without retribution. The mechanism should not impede access to the country's judicial or administrative remedies. The affected people will be appropriately informed about the mechanism.

F. Conservation of Biodiversity and Sustainable Natural Resource Management

12. As per SPS of ADB (2009) executing agency through the consultant will have to assess the significance of project impacts and risks on biodiversity and natural resources, which as an integral part of the environmental assessment process. The assessment will focus on the major threats to biodiversity, which include destruction of natural and critical habitats and introduction of invasive alien species, and on the use of natural resources in an unsustainable manner. The executing agency will need to identify measures to avoid, minimize, or mitigate potentially adverse impacts and risks and, as a last resort, propose compensatory measures, such as biodiversity offsets, to achieve no net loss or a net gain of the affected biodiversity. Study will includes safeguarding the life-supporting capacity of air, water and soil ecosystems. Wherever possible the executing agency will demonstrate the sustainable management of resources through an appropriate system of independent certification. In case of selection of sub-project within core or buffer zone of legally protected area there is a need of review of management plans of protected area along consultation with managers of protected area, local communities and other stakeholder of the proposed project.

G. Pollution Prevention and Abatement

13. As per ADB's 2009 Safeguard Policy pollution Prevention and Abatement is one of the most important requirements needs to be complied. During the design, construction, and operation of the project the executing agency 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*[16]*.* These standards contain performance levels and measures that are normally acceptable and applicable to projects.

14. The executing agency will avoid, or where avoidance is impossible, will minimize or control the intensity or load of pollutant emission and discharge. In addition they will examine

[16] World Bank Group, 2007. *Environmental, Health, and Safety General Guidelines.* Washington, DC.

and incorporate in its operations resource conservation and energy efficiency measures consistent with the principles of cleaner production.

15. The project authority will promote the reduction of project-related anthropogenic greenhouse gas emissions in a manner appropriate to the nature and scale of project operations and impacts.

H. Health and Safety

16. The project authority will provide workers with a safe and healthy working environment, taking into account risks inherent to the particular sector and specific classes of hazards in the work areas, including physical, chemical, biological, and radiological hazards. The authority will take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work by (i) identifying and minimizing, so far as reasonably practicable, the causes of potential hazards to workers; (ii) providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) providing appropriate equipment to minimize risks and requiring and enforcing its use; (iv) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment; (v) documenting and reporting occupational accidents, diseases, and incidents; and (vi) having emergency prevention, preparedness, and response arrangements in place.

17. The project executing agency will identify and assess the risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the project, and will establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts. These measures will favour the prevention or avoidance of risks and impacts over their minimization and reduction. The project authority will inform affected communities of significant potential hazards in a culturally appropriate manner. They will be prepared to respond to accidental and emergency situations. This preparation will include response planning document(s) that addresses the training, resources, responsibilities, communications, procedures, and other aspects required to respond effectively to emergencies associated with project hazards. Appropriate information about emergency preparedness and response activities, resources, and responsibilities will be disclosed to affected communities.

I. Conservation of Cultural Resources

18. The executing agency is responsible for siting and designing the project to avoid significant damage to physical cultural resources. Such resources likely to be affected by the project will be identified, and qualified and experienced experts will assess the project's potential impacts on these resources using field-based surveys as an integral part of the environmental assessment process.

19. When a project may affect physical cultural resources, the implementation authority will consult with affected communities who use, or have used them within living memory, for long-standing cultural purposes to identify physical cultural resources of importance and to incorporate the views of the affected communities on such resources into the executing agency's decision making process.

20. When the project is likely to have adverse impacts on physical cultural resources, the PMU will identify appropriate measures for avoiding or mitigating these impacts as part of the environmental planning process.

APPENDIX 9: RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST

Rapid Environmental Assessment (REA) Check List (Water Supply)

SCREENING QUESTIONS	Yes	No	REMARKS
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 and/or 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	☐	☐	

SCREENING QUESTIONS	Yes	No	REMARKS
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 sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant.	☐	☐	

A. Categorization

[ ] Category A: It is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. Impacts may affect an area larger than the sites or facilities subject to physical works. An EIA including an EMP is required
[ ] Category B: It has less adverse environmental impacts than Category A. Impacts are site-specific, few are irreversible, and in most cases mitigation measures can be designed more readily than Category A. An IEE, including an EMP is required.
[ ] Category C: It is likely to have minimal or no adverse environmental impacts. Environmental implications should be reviewed.

Rapid Environmental Assessment (REA) Check List (Sewage Treatment)

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting Is the project area…			
• Densely populated?	☐	☐	
• Heavy with development activities? •	☐	☐	
• Adjacent to or within any environmentally sensitive areas?	☐	☐	

SCREENING QUESTIONS	Yes	No	REMARKS
▪ 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…			
▪ impairment of historical/cultural monuments/areas and loss/damage to these sites?	☐	☐	
▪ interference with other utilities and blocking of access to buildings; nuisance to neighbouring 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 neighbouring 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?	☐	☐	

SCREENING QUESTIONS	Yes	No	REMARKS
▪ health and safety hazards to workers from toxic gases and hazardous materials which maybe contained in sewage flow and exposure to pathogens in sewage and sludge?	☐	☐	

B. Categorization

[ ] Category A: It is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. Impacts may affect an area larger than the sites or facilities subject to physical works. An EIA including an EMP is required
[ ] Category B: It has less adverse environmental impacts than Category A. Impacts are site-specific, few are irreversible, and in most cases mitigation measures can be designed more readily than Category A. An IEE, including an EMP is required.
[ ] Category C: It is likely to have minimal or no adverse environmental impacts. Environmental implications should be reviewed.

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 I)?	☐	☐	
▪ Could changes in temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (e.g., increased extreme rainfall increases flooding, damaging proposed infrastructure)?	☐	☐	
▪ 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 paving vulnerable groundwater recharge areas, or using water from a vulnerable source that is relied upon by many user groups, or encouraging settlement in earthquake zones)?	☐	☐	

Environments, Hazards and Climate Changes

Environment	Natural Hazards and Climate Change	Example Impact on Urban Development
Arid /Semi-arid and desert environment	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.	Encroachment of sand dunes into urban areas; increased dust and respiratory diseases in peri-urban areas; water and energy shortages in urban areas due to reduced rainfall

Environment	Natural Hazards and Climate Change	Example Impact on Urban Development
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, heat waves 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.	Increases in the intensity of precipitation and floods inundate transport infrastructure causing disruptions in traffic and economic activity; increased food insecurity in urban areas as production levels fall and prices rise
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.	Ground subsidence damages and disrupts services such as water supply and sanitation, energy and transport; increases in the intensity of floods can erode solid waste landfills which can result in the contamination of water resources
Small islands	Small islands generally have land areas of less than 10,000km^2 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 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.	Sea-level rise and storms increase threats to economic growth and populations which are concentrated along coastlines; reduced land availability for urban expansion; damage to port and tourism facilities from sea-level rise, storms and floods.
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.	Human insecurity resulting from glacial lake outbursts and landslides; Reduced income from tourism activities as snow patterns change
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 to infrastructure, loss of life and livelihoods due to natural disasters

APPENDIX 10: CONTENT AND FORMAT OF ENVIRONMENTAL ASSESSMENT DOCUMENTS

1. EIA is an important tool for incorporating environmental concerns at the project level. EIA should be carried out as early as the project planning stage as part of feasibility thus it can assure that the project will be environmentally feasible. The general objectives of the EIA study are to provide;

(i) baseline information about the environmental, social, and economic conditions in the project area;
(ii) information on potential impacts of the project and the characteristic of the impacts, magnitude, distribution, who will be the affected group, and their duration;
(iii) information on potential mitigation measures to minimize the impact including mitigation costs;
(iv) to assess the best alternative project at most benefits and least costs in terms of financial, social, and environment. In addition to alternative location of the project, project design or project management may also be considered; and
(v) basic information for formulating environmental management plan.

2. EIA requires an in-depth analysis because of the potential significance of environmental impacts from the project. EIAs demand: (i) comprehensive analysis of the potential impacts; (ii) works to be carried out to formulate practical mitigation measures; (iii) in-depth economic valuation of impact to screen and evaluate the best alternative; and (vi) in-depth analysis to prepare an adequate environmental management plan.

3. EIA reports should be presented in certain way to meet the requirements of ADB and the DMC. However, wherever possible, ADB requests that the Borrower follow ADB-prescribed format for EIA. This is to ensure that environmental assessment results are presented in a clear and concise fashion to contribute most effectively to decision-making. However, if several other financial institutions fund the proposed Project in the form of co-financing modality, it is necessary for ADB to come up with an agreement with those institutions on EIA reporting requirement. In this context, it is necessary to ensure that the content of the EIA reports cover all issues required by ADB.

4. An environmental assessment report is required for all environment category A and B projects. Its level of detail and comprehensiveness is commensurate with the significance of potential environmental impacts and risks. A typical EIA report contains the following major elements, and an IEE may have a narrower scope depending on the nature of the project. The substantive aspects of this outline will guide the preparation of environmental impact assessment reports, although not necessarily in the order shown.

1. Executive Summary - This section describes concisely the critical facts, significant findings, and recommended actions.

2. Policy, Legal, and Administrative Framework - This section discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party.

3. Description of the Project - This section describes the proposed project; its major components; and its geographic, ecological, social, and temporal context, including any associated facility required by and for the project (for example, access roads, power plants, water supply, quarries and borrow pits, and spoil disposal). It normally includes drawings and maps showing the project's layout and components, the project site, and the project's area of influence.

4. Description of the Environment (Baseline Data) - This section describes relevant physical, biological, and socioeconomic conditions within the study area. It also looks at current and proposed development activities within the project's area of influence, including those not directly connected to the project. It indicates the accuracy, reliability, and sources of the data.

5. Anticipated Environmental Impacts and Mitigation Measures - This section predicts and assesses the project's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic (including occupational health and safety, community health and safety, vulnerable groups and gender issues, and impacts on livelihoods through environmental media [Appendix 2 of ADB Safeguard Policy, para. 6]), and physical cultural resources in the project's area of influence, in quantitative terms to the extent possible; identifies mitigation measures and any residual negative impacts that cannot be mitigated; explores opportunities for enhancement; identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions and specifies topics that do not require further attention; and examines global, transboundary, and cumulative impacts as appropriate.

6. Analysis of Alternatives - This section examines 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. It also states 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 Participation - This section: (i) describes the process undertaken during project design and preparation for engaging stakeholders, including information disclosure and consultation with affected people and other stakeholders; (ii) summarizes comments and concerns received from affected people and other stakeholders and how these comments have been addressed in project design and mitigation measures, with special attention paid to the needs and concerns of vulnerable groups, including women, the poor, and Indigenous Peoples; and (iii) describes the planned information disclosure measures (including the type of information to be disseminated and the method of dissemination) and the process for carrying out consultation with affected people and facilitating their participation during project implementation.

8. Grievance Redress Mechanism - This section describes the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental performance.

9. Environmental Management Plan - This section deals with the set of mitigation and management measures to be taken during project implementation to avoid, reduce, mitigate, or compensate for adverse environmental impacts (in that order of priority). It may include multiple management plans and actions. It includes the following key components (with the level of detail commensurate with the project's impacts and risks): (i) **Mitigation**: (a) identifies and

summarizes anticipated significant adverse environmental impacts and risks; (b)describes each mitigation measure with technical details, including the type of impact to which it relates and the conditions under which it is required (for instance, continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; and (c) provides links to any other mitigation plans (for example, for involuntary resettlement, Indigenous Peoples, or emergency response) required for the project. (ii) **Monitoring**: (a) describes monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits and definition of thresholds that will signal the need for corrective actions; and (b) describes monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation. (iii) **Implementation arrangements**: (a) specifies the implementation schedule showing phasing and coordination with overall project implementation; (b) describes institutional or organizational arrangements, namely, who is responsible for carrying out the mitigation and monitoring measures, which may include one or more of the following additional topics to strengthen environmental management capability: technical assistance programs, training programs, procurement of equipment and supplies related to environmental management and monitoring, and organizational changes; and (c) estimates capital and recurrent costs and describes sources of funds for implementing the environmental management plan. (iv) **Performance indicators**: describes the desired outcomes as measurable events to the extent possible, such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods.

10. Conclusion and Recommendation - This section provides the conclusions drawn from the assessment and provides recommendations.

APPENDIX 11: CONSULTATION AND PARTICIPATION PLAN

C&P Activity	Target Stakeholders	Type of Participation	Objectives of the C&P Activity	Responsible Unit/Persons	Time Frame	Cost Estimate
Project orientation Workshop for government officials, officers, and staff on the Investment program (1 whole day)	50 government officials and staff per project orientation workshop consisting of representatives from the UDHD, BUIDCo, WDC, DOEF, BSPCB, WRD, BRJP, DOF, PDD, ULB officials and staff, especially the Municipal Corporations; and private contractors	Information sharing Consultation Shared responsibility Shared decision-making	Introduce the project Demonstrate the link between improved water supply and sewerage infrastructure and good health, women's empowerment, and environmental conservation (Note: Seminar topics and contents should be gender-sensitive, socially inclusive, and raise environmental awareness). Present Safeguards and Social Frameworks and Plans and disclosure requirements. Discuss roles and accountabilities of various government units. Discuss issues related to use of government lands / property for the project, environmental risks. Mitigate potential problems e.g., citizens' use of government lands and property that will be lost to the project such as school lands, public playgrounds, environmental risks especially to dolphins,	ADB Project Team, UDHD	Year 1: Two project orientation workshops (Patna, Bhagalpur)	$1,000

C&P Activity	Target Stakeholders	Type of Participation	Objectives of the C&P Activity	Responsible Unit/Persons	Time Frame	Cost Estimate
			Gather and agree on recommendations			
4 POS for household heads on the investment program (half day) 2 POS for women only on the investment program (half day)	100 community members, preferably, household heads, with at least 30 women participating per project orientation seminar At least 50 women community members per project orientation seminar	Information sharing Consultation Shared decision-making	Introduce the project, highlighting its importance and benefits to the community Demonstrate the link between improved water supply and sewerage infrastructure and good health, women's empowerment, and environmental conservation. (Note: Seminar topics and contents should be gender-sensitive, socially inclusive, and raise environmental awareness). Present safeguards and social frameworks and plans. Gather concerns and views related to water supply and sewerage. Gather recommendations.	PIU, ULB, in cooperation with the WDC and NGOs.	Years 1-2: Bhagalpur	$ 1000/POS for household heads X 4 POS = **$4,000** $ 500 / POS for women only X 2 POS = **$4,000** Total: **$8,000**
Four FGD, and eight small group meetings on resettlement and compensation issues (half day)	Affected Persons: Farmers, titled and non-titled; landowners, representatives of affected schools (Bhagalpur and Muzaffarpur); and concerned NGOs per FGD 15 affected persons and NGO representatives per	Information sharing Consultation	Introduce the project. Mitigate potential conflict. Solicit the views of affected persons on resettlement and compensation. Agree on resettlement	PMU, PIU, ULB, in cooperation with NGOs	Yrs 1-2: Two FGDs, two small group meetings	$ 500/FGD X 1 = **$500** $ 300/small group meeting X 2 = **$600** Total: **$1,100**

C&P Activity	Target Stakeholders	Type of Participation	Objectives of the C&P Activity	Responsible Unit/Persons	Time Frame	Cost Estimate
	small group meeting		processes, location, and compensation.			
One consultation workshop with fishing communities in Bhagalpur (half day)	Representatives of fishing communities in Bhagalpur	Information sharing Consultation	Introduce the project, highlighting its importance and benefits. Discuss conservation issues and protection of common sources of livelihood. Discuss possible roles as community watchdogs. Mitigate potential conflict Explore alternative means of livelihood.	PMU, PIU, in cooperation with NGOs	Year 1	Consultation workshop = **$500**
One Consultation workshop (half day) with temporarily affected persons	50 hawkers/vendors, and small shopkeepers affected per city	Information sharing Consultation	Introduce the project. Demonstrate the link between improved water supply and sewerage infrastructure and good health, women's empowerment, and environmental conservation. Show possible livelihood/ business opportunities. (Note: Seminar topics and contents should be gender-sensitive, socially inclusive, and raise environmental awareness). Present social and resettlement framework and draft social and resettlement plans. Mitigate potential	PMU, PIU in cooperation with NGOs	Year 1: One consultation workshop	**$1,500**

C&P Activity	Target Stakeholders	Type of Participation	Objectives of the C&P Activity	Responsible Unit/Persons	Time Frame	Cost Estimate
			resistance to the project. Gather recommendations Agree on remedial measures.			
One Consultation workshop with the academe, NGOs, and other civil society organizations (1 whole day)	50 representatives of the academe, NGOs, and other civil society organizations from Patna and the four project cities.	Information sharing/knowledge generation. Consultation Shared responsibility	Introduce the project. Demonstrate the link between improved water supply and sewerage infrastructure and good health, women's empowerment, and environmental conservation. Show possible livelihood/ business opportunities. (Note: Seminar topics and contents should be gender-sensitive, socially inclusive, and raise environmental awareness). Gather knowledge on conservation and mitigation measures. Mitigate potential resistance to the project. Discuss possible roles as watchdogs of the project's implementation. Gather other relevant recommendation	PMU, in cooperation with the WDC and NGOs	Year 1: One consultation workshop	Consultation Workshop = **$1,000** Travel of participants from out of town = **$500** Total: **$1,500**
Strategic and Action Planning Workshop (1 whole day)	PMU, members of the PSC, members of the Town/City Committee, PIU, and	Information sharing Shared responsibility.	Develop strategic and action plans in accordance with the project road map.	PMU, PIU, ADB Project Team	Planning Workshop: Annually	Planning Workshop: $1,000 X 5

C&P Activity	Target Stakeholders	Type of Participation	Objectives of the C&P Activity	Responsible Unit/Persons	Time Frame	Cost Estimate
PMU/PIU Monitoring Meetings (half day) PSC Meetings (half day) Town/City Committee Meetings (half day)	private contractors / implementing firms from Patna and 4 project cities	Shared decision-making Control	Review compliance with social safeguards, environment, and gender frameworks and plans. Discuss progress in implementation, including problems encountered and means to mitigate/address them. Regularly report on the progress of implementation.		PMU, PIU Monitoring Meetings: Quarterly PSC Meetings: Annually Town/City Committee Meetings: Quarterly	years = **$5,000** PMU/PIU Monitoring Meetings: $300 X 4 = **$1,200** PSC Meetings: $300 X 4 years = **$1,200** Town/City Committee Meetings: $300 X 4 X 4 years = **$4,800**
Participatory Monitoring Meetings (half day) (for community watchdogs)	20 representatives (50% women) from the community and civil society (representatives of CBOs, NGOs, ward committees, fishing communities, poor/slum communities, private sector) in each project city	Information sharing. Shared responsibility	Surface issues and concerns during project implementation. Discuss and recommend measures to mitigate/address the problems. Monitor progress of project implementation	ULB, NGO, WDC	Participatory Monitoring Meetings: Semi-annually	$300 X 2 meetings X 4 years = **$2,400**
TOTAL COST OF CONSULTATION AND PARTICIPATION						**$28,200 (INR ~1.27 million)**

ADB = Asian Development Bank, BRJP = Bihar Raiya Jal Parshad, BSPCB = Bihar State Pollution Control Board, BUIDCo = Bihar Urban Infrastructure Development Corporation, C&P = consultation and participation, CBO = community-based organizations, DOEF = Department of Environment and Forests, DOF = Department of Finance, FGD = focus group discussion, NGO = non-government organization, PDD = Planning and Development Department, PIU = project implementation unit, PMU = project management unit, POS = project orientation seminar, PSC = Project Steering Committee, UDHD = Urban Development and Housing Department, ULB = urban local body, WDC = Women's Development Corporation, WRD = Water Resource Department.

APPENDIX 12: SAMPLE GRIEVANCE REGISTRATION FORM

(To be available in Hindi, Urdu and Other Local Language, if any)

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**			
Contact Information/Personal Details					
Name		**Gender**	*** Male** *** Female**	**Age**	
Home Address					
Village / Town					
District					
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 Official(s) reviewing grievance)	
Action Taken:	
Whether Action Taken Disclosed:	Yes No
Means of Disclosure:	

APPENDIX 13: ENVIRONMENTAL MONITORING FORMAT

A. Work Details

Table A13.1: Work Details and Risks

Locations	Sub-projects Components (Package No.)	Name of the contractor	Listing of works under the package	Starting Date (land clearance) and schedule date of completion	What type of works continued at present	Progress Percentage	Expected changes from approved scope	Fulfilment of objectives- Type of remedial measures needed	Key assumptions and risks that affect attainment of the objectives

B. Implementation of Environmental Management Plan

TableA13.2: Status of Environment, Forests and Other Clearances

City/ Town	Work (Package No.)	Applicable Legislation/ Type of clearance	Clearance given by and date	Subject/ Issue	Remarks/ Action needed

Table A13.3: Compliance with Environmental Management Plan

Description of Impact	Mitigation measures Proposed	Implementation status	Detail/ Remarks on implementation	Monitoring methods & frequency	Monitoring conducted by	Monitoring Remarks (Excellent/Satisfactory/Partially Satisfactory/Below Satisfaction/Poor/Very Poor)	Remarks and actions taken to improve implementation
Pre-Construction							
Construction							
Operation (Defect Liability Period)							

Table A13.4: Measurement of Pollutants

Components	Package/ Location	Period of monitoring	Parameters/Pollutants	Standard	Base line status	Monitoring result during project Implementation	Remarks
Noise							
Air Quality							
Water Quality							
Soil Quality							
Process Generated Sludge							