Environmental Assessment and Review Framework

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IND: West Bengal Drinking Water Sector Improvement Project

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CURRENCY EQUIVALENTS

(as of 11 July 2018)

Currency unit – Indian rupee (₹)

₹1.00 = $0.014

$1.00 = ₹68.691

ABBREVIATIONS

ADB	–	Asian Development Bank
ASI	–	Archaeological Survey of India
CPCB	–	Central Pollution Control Board
CRZ	–	Coastal Regulation Zone
CTE	–	consent to establish
CTO	–	consent to operate
DMA	–	district metered area
DSISC	–	design, supervision and institutional support consultant
EAC	–	expert appraisal committee
EARF	–	environmental assessment and review framework
EIA	–	environmental impact assessment
EKW	–	East Kolkata Wetlands
EMP	–	environmental management plan
EMS	–	environmental management specialist
ESZ	–	Eco Sensitive Zone
GLSR	–	ground level storage reservoir
GOWB	–	Government of West Bengal
HSGO	–	head, safeguards and gender officer
HTL	–	high tide line
IEE	–	initial environmental examination;
KOPT	–	Kolkata Port Trust
LTL	–	low tide line
MOEFCC	–	Ministry of Environment, Forest and Climate Change
MSWM	–	municipal solid waste management
NEP	–	National Environment Policy
NOC	–	No Objection Certificate
O&M	–	operation and maintenance
OHT	–	overhead tank
PAM	–	Project Administration Memorandum
PHED	–	Public Health Engineering Directorate
PIU	–	project implementation unit
PMC	–	project management consultant
PMU	–	project management unit
PPTA	–	project preparatory technical assistance
REA	–	rapid environmental assessment
ROW	–	right-of-way
SCADA	–	Supervisory Control and Data Acquisition
SEIAA	–	State Environmental Impact Assessment Authority
SGC	–	safeguards and gender cell
SPS	–	Safeguard Policy Statement
UNFCCC	–	United Nations Framework Convention on Climate Change
UNESCO	–	United Nations Educational, Scientific and Cultural Organization
WBDWSIP	–	West Bengal Drinking Water Sector Improvement Project

WBPCB	–	West Bengal Pollution Control Board
WLS	–	Wildlife Sanctuary
WNBR	–	World Network of Biosphere Reserves
WTP	–	water treatment plant

WEIGHTS AND MEASURES

g/kmh	-	gram per kilometer-hour
lpcd	-	liter per capita per day
ml	-	milliliter
MLD	-	million liters per day
mg/L	-	milligram per liter
km^2	-	square kilometer

NOTE

In this report, "$" refers to United States dollars.

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I. INTRODUCTION

A. Overview of the Sector Project

1. The proposed West Bengal Drinking Water Sector Improvement Project (WBDWSIP) aims to provide safe, reliable and continuous drinking water as per Government of India's standard to about 1.65 million people in the Arsenic, Fluoride, and salinity affected selected areas of North 24 Parganas, South 24 Parganas, East Medinipur and Bankura districts of West Bengal.

2. The Project will adopt a sector approach, and subprojects will be selected and proposed for funding adhering to the agreed Subproject Selection Criteria (SSC).[1] Project districts are North 24 Parganas (with two blocks of South 24 Parganas included for distribution network), Bankura and East Medinipur. Subprojects to be covered under the Project will be within these districts only unless otherwise agreed with ADB.[2]

3. The project is aligned with the following impact: drinking water security ensured in West Bengal. The project will have the following outcome: safe, sustainable, and inclusive drinking water service received in project districts. The Project outputs are as follows:

(i) **Output 1: Climate resilient drinking water infrastructure constructed.** The project will provide a minimum of 70 lpcd of continuous potable water through metered connections to the households in selected areas of the project districts. The distribution systems will be designed on a DMA basis. Both the bulk and the distribution systems will be integrated with modern STWM and monitoring tools, including supervisory control and data acquisition and geographic information systems. Bulk water supply systems, consisting of intakes, water treatment plants, and transmission mains, will be sized to provide water supply en route to urban and rural areas. They will be connected into a grid with the existing and the new systems in the project districts, where feasible, to reduce redundancy, improve resilience, and efficiently manage the system; and

(ii) **Output 2: Institutions and capacity of stakeholders for drinking water service delivery strengthened.** The project will strengthen institutions and the capacity of stakeholders, including the PHED and the project gram panchayats, for sustainable service delivery. It will support them to operate the STWM system, including water quantity and quality monitoring, electronic billing and collections, meter reading, and accounting. The project will build capacities and skills of the stakeholders on O&M, and support public awareness on water, sanitation, and hygiene. It will strengthen the sector through introducing and implementing an AMSDF; institutionalizing water and sanitation safety planning; and developing a regulatory framework for, and piloting, fecal sludge and septage management.

4. **Detailed Description of Project Outputs**. In line with the agreed SSC, the following subprojects are proposed under the Project's Output 1: Climate resilient drinking water infrastructure constructed:

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[1] Project Administration Manual (PAM) Appendix 1.

[2] Subprojects proposed under the Project stem from a district-wide comprehensive water quality and sustainability planning and completion of the Drinking Water Quality Action Plan (DQWAP) for the concerned district. The DQWAP for the Project districts supported by the Project were prepared by the executing agency, the Public Health and Engineering Department (PHED) of GOWB, with support of project preparatory consultants from the Asian Development Bank (ADB), and has been adopted by PHED to guide present and future drinking water improvement in the districts. [3] Per the ADB SPS 2009, would be classified as Category A.

(i) **Climate-resilient drinking water infrastructure constructed in North 24 Parganas (including two blocks of South 24 Parganas).** The subproject will benefit around 550,000 people with surface-sourced potable water in the arsenic affected areas of Haroa and Barasat-II blocks in the North 24 Parganas district, and the Bhangar II block of the South 24 Parganas district. The key components of the subproject are (a) the construction of a water treatment plant with capacity of 100 million liters per day (MLD) at Rajarhat, (b) laying of around 4 kilometers (km) of transmission mains, (c) the construction of water reservoirs of around 32 million liters combined capacity, (d) the construction of three intermediate booster stations, and (e) the construction of around 39 overhead tanks and laying of distribution networks in 37 zones with around 120,000 household connections including water meters and associated STWM devices**;**

(ii) **Climate-resilient drinking water infrastructure constructed in Bankura.** The subproject will benefit around 680,000 people with surface-sourced potable water in the fluoride affected blocks of Gangajalghati, Indpur, Mejhia, and Taldangra. The key components of the subproject are: (a) appropriate source augmentation, such as the construction of an infiltration gallery, of around 33 MLD for the blocks of Mejhia and Gangajalghati; (b) construction of an intake and water treatment plant of around 32 MLD at Mukutmanipur dam for the blocks of Indpur and Taldangra, (c) construction of new storage facilities of around 38 ML capacity, (d) laying of around 300 km of transmission mains and around 2,100 km of distribution network, and (e) provision of around 155,000 household connections including water meters and associated STWM devices; and

(iii) **Climate-resilient drinking water infrastructure constructed in Purba Medinipur.** The subproject will benefit around 420,000 people with surface-sourced potable water in the salinity affected areas of Nandigram-I, Nandigram-II, Nandakumar, and Chandipur blocks of Purba Medinipur district. The key components of the subproject are (a) the construction of an intake and 100 MLD capacity water treatment plant, (b) the construction of four block-level storage reservoirs and associated booster pumping stations, (c) laying of around 64 km of primary transmission mains, (d) the construction of storage reservoirs of around 24 million liters capacity, (e) laying of the water supply distribution network of around 1,500 km in the two priority blocks, and (f) the provision of around 116,000 household connections including water meters and associated STWM devices.

5. Similarly, the following will be achieved under the Project's Output 2: Institutional strengthening and capacity building for inclusive operational sustainability achieved:

(i) Adoption of the AMSDF by the project gram panchayats;
(ii) Completion of comprehensive DWQAPs for all districts in West Bengal;
(iii) Commissioning of the STWM system in PHED and project gram panchayats;
(iv) Completion of guidelines for water safety and sanitation safety plans, and a model plan each for water safety and sanitation safety, for West Bengal;
(v) Commissioning of flood forecasting and early warning system in Purba Medinipur;
(vi) Preparation and adoption of gender strategy by PHED;
(vii) Completion of the FSSM regulatory framework for West Bengal and commissioning of a pilot FSSM plant in one of the project districts;
(viii) Provision of training on utility management to at least 660 locals—including at least 33% female—in project gram panchayats;

(ix) Provision of training on utility management to a minimum of 200 PHED staff, including 100% of the female staff of the project management unit (PMU) and project implementation units (PIUs);
(x) Provision of training on leadership and water-related livelihood to at least 300 locals—with a minimum of 33% females—in project gram panchayats; and
(xi) Provision of public awareness on water conservation, demand management, and WASH to at least 500 locals in project gram panchayats—33% minimum female.

6. A series of subprojects will be implemented under the project to improve water supply in an area. The main types of infrastructure and their principal components are shown in Table 1. Subproject/components that are likely to have significant adverse environmental impacts[3] will not be considered for implementation.

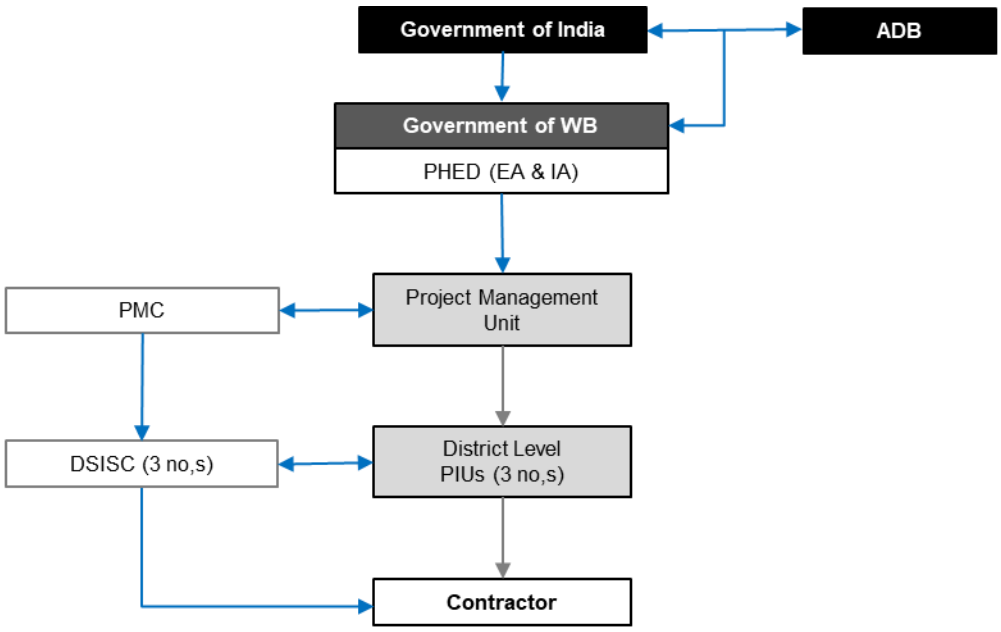
Table 1: Subprojects and Components Proposed under WBDWSIP

Subproject	Main Components	Infrastructure (New or Refurbished)
Water Supply	Bulk water system	Intakes (river intake/ groundwater wells) Raw water transmission Water treatment plants Clear water reservoir Clear water transmission Ground level storage reservoirs (GLSRs) Raw, clear water and booster pumping stations Bulk Flow meters
	Distribution system	Overhead tanks (OHT) Feeder mains from GLSR to OHTs Distribution mains from OHTs Distribution lines Flow meters House connections and meters

7. **Implementation Arrangements**. Public Health Engineering Department (PHED) of Government of West Bengal will be the executing agency and implementing agency, responsible for management, coordination and execution of all activities funded under the loan. A PMU will be exclusively established in PHED for implementation of WBDWSIP. PMU will be supported by district level project implementation units (PIUs). PMU will be headed by a Project Director in the rank of Chief Engineer. Each PIU will be headed by an Executive Engineer, reporting directly to the Project Director. PMU with the support of PIUs will be responsible for planning, implementation, monitoring and supervision, and coordination of all activities under the WBDWSIP. A PIU for North 24 Parganas district has already been established, and process is on for establishing PIUs in Bankura and East Medinipur. A Project Management Consultant (PMC) will be appointed to assist PMU in implementation of the Project. Also, each PIU will be supported by a Design, Supervision and Institutional Support Consultant (DSISC); there will be three DSISCs supporting 3 PIUs respectively in N24P, Bankura and East Medinipur districts. An NGO Consultant will also be appointed for capacity building of Gram Panchayats. PIUs will appoint construction contractors to build infrastructure. Once the infrastructure is built and commissioned, PHED/Gram Panchayat will operate and maintain the infrastructure.

[3] Per the ADB SPS 2009, would be classified as Category A.

Figure 1: Project Implementation Arrangement



ADB – Asian Development Bank; DSISC = Design, Supervision, & Implementation Support Consultant; EA – Executing Agency; GoWB – Government of West Bengal; IA – Implementing Agency; PHED – Public Health Engineering Department ; PMC = Project Management Consultant

B. Purpose and Overview of the Environmental Assessment and Review Framework

8. For subprojects in districts of North 24 Parganas, Bankura and East Medinipur districts, technical feasibility studies, preliminary designs, and safeguard due diligence studies have been conducted as part of the project preparation during the loan processing prior to approval. Rest of the subprojects either identified only in outline or some are yet to be identified. The formulation of these water supply schemes, feasibility and design will take place after the Board's approval of loan. This EARF applies to entire project, but more specifically to the subprojects that will be prepared or amended after ADB board approval.

9. The EARF aims to provide guidance on safeguard screening, assessment, institutional arrangements, and processes to be followed for subprojects/components, where design takes place after ADB Board approval. The EARF (i) describes the project and its components, (ii) explains the general anticipated environmental impacts and mitigation measures for the subprojects, (iii) specifies the requirements that will be followed in relation to screening and categorization, assessment, and planning, including arrangements for meaningful consultation with affected people and other stakeholders and information disclosure requirements, (iv) assesses the capability of the executing and implementing agencies to implement national laws and ADB's requirements, and identifies needs for capacity building, (v) specifies implementation procedures, institutional arrangements, and capacity development requirements, and (vi) specifies monitoring and reporting requirements.

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

C. Environmental Categorization of WBDWSIP

11. Draft IEEs were prepared for three sample subprojects comprising four contract packages during the loan preparation phase.[4] The draft IEEs concluded that these subprojects will have only small-scale, localized impacts on the environment which can be readily mitigated. The potential environmental impacts are mainly related to the construction period, which can be minimized by the mitigating measures and environmentally sound engineering and construction practices. Therefore, the project has been classified into environmental category B. It is likely that future subprojects will seek to replicate the sample subprojects and are thus expected to be category B due to the low-impact nature of such works. No category A-type works (having significant impacts) will be considered in WBDWSIP. The IEEs outlined mitigation measures for potential negative environmental impacts, and monitoring plans for both construction and post-project maintenance phases, and it is expected that the EARF will support the integration of these measures and practices in the project design.

II. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

A. Country Environmental Safeguard Policies

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

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

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

14. **Environment (Protection) Act, 1986, Amended 1991**. This Act is promulgated as umbrella legislation for the protection of environment in the country, and seeks to address the gaps in earlier legislations relating to environment. This Act also empowers the government to make rules for protection, conservation and management of environment. The Central government may put restrictions on an area in which any activity/industry, operation or process or class of industries or operations shall not be carried out. If they are to be carried out, they may be permitted with certain safeguards. The Central government may notify emission and effluent

[4] The IEEs prepared covered: (i) package No. WW/N24P/01 – Haroa Block in North 24 Parganas district and Bhangar II block in South 24 Parganas district; (ii) WW/N24P/02A – Haroa block in North 24 Parganas, (iii) WW/N24P/02B: Bhangar II Block in South 24 Parganas, and (iv) WW/BKP/01 – Indpur -Taldangra block in Bankura

standards; the state governments (in case of West Bengal, the West Bengal Pollution Control Board, WBPCB) can notify more stringent standards for their states but can't be relaxed.

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

(i) No persons shall knowingly cause or permit any poisonous, noxious or polluting matter determined in accordance with such standards as may be laid down by the SPCB to enter (directly/ indirectly) into any stream or well or sewer or on land
(ii) No person shall cause or permit to enter into any stream any other matter which may tend, either directly or in combination with similar matters, to impede the proper flow of the water of the stream in a matter leading or likely to lead to a substantial aggravation of pollution due to other causes or of its consequences
(iii) No person shall, without the prior consent of the State Pollution Control Board:
    a. Establish or take any steps to establish any industry, operation or process, or any treatment and disposal system or an extension or addition which is likely to discharge sewage or effluent into stream, well, sewer or on land;
    b. Setting up of industry or process that generates wastewater requires SPCB's consent to establish and consent to operate after the establishment;
    c. Bring into use any new or altered outlets for the discharge of sewage;
    d. Begin to make any new discharge of sewage; and
    e. Penalties for violation of provisions of the Act.

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

17. Department of Environment, GOWB, has issued a direction in 2009 under the Air Act, 1981 laying down norms for control of air pollution from construction activities. This prescribes two sets of norms: preventive measures, and practices to be discarded to complied by all agencies undertaking the construction activities in the state of West Bengal. It provided for legal action, stoppage of work and imposition of pollution cost on violation of norms. This direction was issues based on a study conducted by WBPCB with the help of ADB on contribution of construction activities to the air pollution in Kolkata and surrounding areas.

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

19. **Construction and Demolition (C and D) Waste Management Rules, 2016.** These Rules notified in March 2016 apply to waste resulting from construction, remodeling, repair and

demolition of any civil structure. Rules define C and D waste as waste comprising of building materials, debris resulting from construction, re-modeling, repair and demolition of any civil structure. Waste generator is responsible for collection, segregation of concrete, soil and others waste and storage of C and D waste generated as notified by the local authority. C and D waste shall not be mixed with other solid waste. If waste generation is more than 20 tons per day or 300 tons per month, the rules requires submission of waste management plan to the local authority prior to start of work. Rules also notify duties of service providers (like water supply, sewerage etc.,) often generate C and D waste, and requires preparation of a comprehensive waste management plan within six months from the date of this notification. As per the notification, each state should establish C and D waste processing facility.

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

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

21. **Wildlife (Protection) Act, 1972**. Comprehensive act for protection and management wildlife, and empowers the government to declare and administer the activities in the Protected Areas (Wildlife Sanctuaries, National parks, biosphere reserves etc.,), and creation of State Wildlife Boards and National Board of Wildlife. Conversion of forest lands that are part of National Parks/Sanctuaries and Tiger Reserve areas (notified under Indian Wildlife (Protection) Act, 1972) is not permitted. In exceptional case, the State Government requires consent of the National Board for Wildlife and Central Empowered Committee of Supreme Court for obtaining wildlife clearance from MOEFCC. In West Bengal State, there are 6 national parks, 15 wildlife sanctuaries, one biosphere reserves.

22. **The Ancient Monuments and Archaeological Sites and Remains Act, 1958 and it's Amendment, 2010.** According to this Act, area within the radii of 100m and 300m from the "protected area" are designated as "prohibited area" and "regulated area" respectively. No development activity (including construction, mining, excavating, blasting) is permitted in the "prohibited area" and development activities likely to damage the protected property are not permitted in the "regulated area" without prior permission of the National Monument Authority.

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

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

25. Category B projects require environmental clearance from the State Environmental Impact Assessment Authority (SEIAA). The State level EAC categorizes the project as either B1 (requiring EIA study) or B2 (no EIA study), and prepares TOR for B1 projects within 60 days. On completion of the study and review of the report by the EAC, the SEIAA issues the Environmental Clearance based on the EAC recommendation. The Notification also provides that any project or activity classified as category B will be treated as category A if it is located in whole or in part within 10 km from the boundary of protected areas, notified areas or inter-state or international boundaries. At present, water supply projects proposed under WBDWSIP do not fall under the ambit of the EIA Notification, 2006, and therefore Environmental Clearance is not required.

26. **Coastal Regulation Zone Notification, 2011**. This supersedes the Notification issued in 1991. To ensure livelihood security to the fisher communities and other local communities, living in the coastal areas, to conserve and protect coastal stretches, its unique environment, promote sustainable development considering natural hazards, sea level rise due to global warming, this Notification declares coastal stretches as Coastal Regulation Zone (CRZ) and restricts new construction, and industrial activities. West Bengal has a coastline of 157.5 km. CRZ (landward side) include the following: (i) land area from High Tide Line (HTL) to 500 m on the landward side on the sea front: (ii) land area between HTL to 100 m or width of creek whichever is less on the landward side along the tidal influenced water bodies connected to sea and; (iii) land area between HTL and LTL. Notification defines CRZ in I. II, III, IV Categories based on the environmental sensitivity and existing development. All activities in the CRZ will require permission of the State Coastal Regulation Zone Management Authority (CRZMA) specifically set up under the Notification. For projects which do not required EIA study and Environmental Clearance as per the EIA Notification, 2006, will require Rapid Environmental Impact Assessment Study (conducted by an accredited consultation according to EIA Notification 2006) for obtaining CRZ clearance.

27. **Other National Legislations**. The other legislations relevant to the project include The Motor Vehicles Act, 1988, Workmen Compensation Act, 1923, The Public Liability Insurance Act, 1991, The Explosives Act (and Rules), 1884 (revised in 1983), Contract Labour (Regulation and Abolition) Act, 1970, Minimum Wages Act, 1948, Payment of Wages Act, 1936, Equal Remuneration Act, 1979, Child Labour (Prohibition and Regulation) Act, 1986, The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act, 1996, Mines and Minerals (Development and Regulation) Amendment ACT, 2015, Public Liability and Insurance Act 1991, Explosive Act 1984, The Building and Other Construction Workers (regulation of employment and conditions of service) Act, 1996, Bonded Labour System (Abolition) Act, 1976 along with Rules, 1976, Contract Labour (Regulation and Abolition) Act 1970 along with rules, 1971;

28. **State and State–specific Legislations**. Following Acts, Rules, Directions etc., that are in force in West Bengal and may apply to the project implementation. Applicability, and requirements of these legislations are discussed in Table 2.

(i) The Major Port Trusts Act, 1963 (Kolkata Port Trust, KoPT);
(ii) West Bengal State Water Policy;
(iii) Notification on Air Pollution, Department of Environment, GOWB, March 2010 (issued under the Air Act, 1981);
(iv) Direction of West Bengal Department of Environment under the Air Act, 1981 Direction No. EN/3170/T-IV-7 /001/2009 dated: 10 December 2009;
(v) West Bengal Ground Water Resources (Management, Control and Regulation) Act, 2005;
(vi) West Bengal Inland Fisheries Act, 1984;
(vii) East Kolkata Wetlands (Conservation and Management) Act, 2006;
(viii) West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006;
(ix) West Bengal Trees (Protection and Conservation in Non-Forest Areas) Rules, 2007;
(x) West Bengal Action Plan on Climate Change;
(xi) The West Bengal Preservation of Historical Monuments and Objects and Excavation of Archaeological Sites Act, 1957;
(xii) The West Bengal Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and Rules, 2004.

29. Table 2 presents salient features and applicability of acts, rules and regulations currently in force that could apply to WBDWSIP including the specific requirements. Appendix 1 includes environmental standards for air, surface water, groundwater, emissions, noise, vehicular exhaust and disposal to land/agricultural, use of sludge and bio-solids. Appendix 2 provides the applicable drinking water standards as per Indian and World Health Organization drinking water guideline values.[5]

[5] ADB SPS requires applying pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels or measures, WBDWSIP will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of WBDWSIP circumstances, PHED will provide full and detailed justification for any proposed alternatives that are consistent with ADB SPS requirements.

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

Ref.	Legislation	Policy Description	Regulator	Applicability
A	**National Level**			
1.	National Environment Policy (NEP), 2006.	NEP is a comprehensive guiding document in India for all environmental conservation programs and legislations by Central, State and Local Government. The dominant theme of this policy is to promote betterment of livelihoods without compromising or degrading the environmental resources. The policy also advocates collaboration method of different stakeholders to harness potential resources and strengthen environmental management.	Not applicable	West Bengal Drinking Water Sector Improvement Project (WBDWSIP) should adhere to NEP principle of "enhancing and conservation of environmental resources and abatement of pollution".
2.	Water (Prevention and Control of Pollution) Act, 1974, amended 1988 and its Rules, 1975.	Water (Prevention and Control of Pollution) Act was established to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, by Central and State Boards and for conferring on and assigning to such Boards powers and functions relating thereto and for matters connected therewith.	West Bengal Pollution Control Board (WBPCB)	- Applicable for the construction and operation of the water treatment plant (WTP); - Consent to establish (CTE) and consent to operate (CTO) from WBPCB; Compliance to conditions and disposal standards stipulated in CTE and CTO.
3.	Air (Prevention and Control of Pollution) Act, 1981, amended 1987 and its Rules, 1982.	An agreement for the preservation of the natural resources which included air and water preservation was finalized at the United Nations Conference on the Human Environment held in Stockholm in June 1972, in which India participated. Following this the Air (Prevention and Control of Pollution) Act was enacted to achieve prevention, control and abatement of air pollution activities by assigning regulatory powers to Central and State boards for all such functions. Establishes ambient air quality standards	WBPCB	- Applicable for equipment and machinery's potential to emit air pollution (including diesel generators and vehicles); - CTE and CTP from WBPCB; - Compliance to conditions and emissions standards stipulated in the CTE and CTO.
4.	Environmental (Protection) Act, 1986 amended 1991 and the following rules/notifications:	Following the United Nations Conference on the Human Environment held at Stockholm in June 1972, an Act to provide for the protection and improvement of environment and for matters connected therewith was framed in India. This would cover the protection and improvement of environment and the prevention of hazards to human beings, other living creatures, plants and property.	WBPCB	-
a.	EIA Notification, 2006.	Issued under the Environmental Protection Act, 1986, the Environmental Impact Assessment (EIA) Notification of 2006 (replacing the EIA Notification of 1994), sets out the requirement for Environmental Assessment. Environmental Clearance is required for specified activities/projects. Projects are categorized as A or B. Environmental clearance process comprise of a maximum of four stages: Stage (1) Screening (2) Scoping (3) Public Consultation and (4) Appraisal	Ministry of Environment Forest and Climate Change	WBDWSIP subprojects are not included in the list of projects requiring Environmental Clearance, therefore EIA and Environmental Clearance is not required
b.	Environment (Protection) Rules,	These rules specify: -Standards for emissions or discharge of environmental pollutants	WBPCB	- WTPs should be designed and operated with appropriate

Ref.	Legislation	Policy Description	Regulator	Applicability
	1986 including amendments.	-Prohibitions and restrictions on the location of industries -Procedure for taking samples and submission of samples for analysis, -Prohibition and restriction on the handling of hazardous substances in different areas -Submission of environmental reports -Etc.		wastewater and sludge treatment and disposal facilities; - compliance with emission and disposal standards during construction.
c.	Municipal Solid Wastes Management Rules, 2016	Rules to manage municipal solid waste generated; provides rules for segregation, storage, collection, processing and disposal.	WBPCB	Solid waste generated at proposed facilities shall be managed and disposed in accordance with the Rules
d.	Construction and Demolition Waste Management Rules, 2016	Rules to manage construction and to waste resulting from construction, remodeling, repair and demolition of any civil structure. Rules define C and D waste as waste comprising of building materials, debris resulting from construction, re-modeling, repair and demolition of any civil structure.	WBPCB	Construction and demolition waste generated from the project construction shall be managed and disposed as per the rules
e.	Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2009	- Rules defines and classifies hazardous waste, and procedures for handling and storage - Requires Pollution Control Board's consent for handling hazardous waste - provides procedures for recycling, reprocessing or reuse, import and export of HW - Rules for development of treatment, storage, disposal facility (TSDF) for hazardous wastes; TSDF shall be developed following guidelines issued by Central Pollution Control Board (CPCB)	CPCB and WBPCB	- Applies to disposal of hazardous waste -sludge generated from WTP is unlikely to be classified as hazardous waste
f.	Noise Pollution (Regulation and Control) Rules, 2000.	The increasing noise level in public places from various sources have delirious effects on humans and thereby it is considered necessary to regulate and control noise generating sources to maintain ambient air quality standards through a set of rules. The ambient air quality standards are achieved through enforcement of noise pollution control measures and restrictions on the use sound producing instruments. In case of any violation in silence zone area, complaints to be made to authority and power to prohibit continuance of music sound or noise also falls under within these rules	WBPCB	- Compliance with noise standards.
g.	Notification of Eco Sensitive Zones (ESZ):	Eco sensitive zones are of significant ecological importance, and to conserve and protect the natural resources and living beings, several zones are declared in the country as eco sensitive zones by notifications. Besides for specific reasons, buffer areas around protected areas (national park, wildlife sanctuaries etc.,) are also declared as ESZ in this notification. - Notified ESZs in West Bengal are: ESZ around Dalma wildlife sanctuary (in Jharkhand state) established in 2012 falling partly in West Bengal(Purulia); draft notifications issued for 3 ESZs in 2016-17: ESZs around Jaladapara National Park Alipurduar District, Neora Valley National Park and Singalila National Park in Darjeeling	Forest Department, Government of West Bengal (GOWB) and Ministry of Environment, Forest and Climate Change (MOEFCC)	- Restriction of activities (including construction, tree cutting, etc.) in the notified zones -Any project activity located in ESZs will require prior permission from ESZ monitoring committee
h	Wetland	-For the protection of wetlands and restriction of certain activities within	Central	- East Kolkata wetlands is a

Ref.	Legislation	Policy Description	Regulator	Applicability
	(Conservation and Management) Rules, 2010	wetlands, provides a regulatory mechanism --Applies to protected wetlands notified under the rules (which include Ramsar sites; wetlands in ESZs /United Nations Educational, Scientific and Cultural Organization (UNESCO) sites, high altitudes, etc.) - Rules prohibit: reclamation of wetlands, expansion/ setting new industries, hazardous waste storage, disposal., discharge of untreated effluent, permanent construction within 50 m HFL, etc., -Activities such as the following are regulated: water withdrawal/diversion, treated effluent discharge, dredging, repair of existing infrastructure, buildings and construction	Wetlands Regulatory Authority	protected wetland; projects located in or near EKW will attract the rules
I	Coastal Regulation Zone (CRZ) Notification, 2011	This supersedes the CRZ Notification issued in 1991; to ensure livelihood security to the fisher communities and other local communities, living in the coastal areas, to conserve and protect coastal stretches, its unique environment, promote sustainable development considering natural hazards, sea level rise due to global warming Declares coastal stretches as CRZ and restricts new construction, and industrial activities. West Bengal has a coastline of 157.5 km. CRZ (landward side) include the following: (i) land area from High Tide Line (HTL) to 500 m on the landward side on the sea front: (ii) land area between HTL to 100 m or width of creek whichever is less on the landward side along the tidal influenced water bodies connected to sea and; (iii) land area between HTL and LTL. Notification defines CRZ in I. II, III, IV Categories based on the environmental sensitivity and existing development.	West Bengal Coastal Regulation Zone Management Authority (CRZMA)	-Applies to all activities in the coast regulation zone (CRZ) as defined by the Notification -CRZ is further defined as CRZ --Groundwater abstraction in the CRZ is restricted -All project activities falling in the CRZ requires clearance from the West Bengal CRZ Management Authority; clearance requires conduct of rapid EIA study by an accredited consultant
j	Manufacture, Storage, and Import of Hazardous Chemical Rules, 1989	-Defines hazardous chemicals - stipulates rules, procedures to manufacture, storage and import of hazardous chemicals -chlorine, which will be used for WTP for disinfection is a hazardous chemical as per the rule -requires permission, authorization from various agencies if the total storage exceeds specified quantity; requires emergency management plan	Various agencies	-proposed WTPs that requires storage of more than 10t chlorine will fall under this
5.	Indian Wildlife (Protection) Act, 1972 amended 1993 and Rules 1995; Wildlife (Protection) Amendment Act, 2002	An Act to provide for the comprehensive protection of wild animals, birds and plants. This would cover matters concerning Appointment of forest authorities, hunting of wild animals, protection of specified plants, conservation of national parks and sanctuaries, trade commerce in relation to plants and animals and prevention of any offences. Wildlife protected areas are notified under this act. There are 6 national parks and 15 wildlife sanctuaries in West Bengal (Appendixes 3 and 4)	National Board of Wildlife / State wildlife boards	- Applicable to subprojects located in in protected areas - Permission from the Chief Wildlife Warden/ State Wildlife Board/ National Board of Wildlife; and the Supreme Court of India
6.	Indian Forest Act, 1927	The Indian Forest Act 1927 was enacted to consolidate the law relating to forests, the transit of forest-produce and the duty leviable. Applies reserved forests, village forests, and protected forests. This act also concerns lands not being the property of government. Provides penalties and procedures with	MOEFCC West Bengal Forest	- Applicable to subprojects located in the forest lands as defined under the Act

Ref.	Legislation	Policy Description	Regulator	Applicability
		regard to all property, cattle trespasses and powers of Forest officers; declaration of forest areas (reserved, protected and village forests), and regulation of activities within the forests	Department	
7.	Forest (Conservation) Act, 1980, amendment 1988	Act provides for conservation of forests Restricts the dereservation of forests or use of forest lands for non-forest purpose Non-forest purpose means breaking up or clearing of any forest land	MOEFCC West Bengal Forest Department	- Restricts use of forest lands for non-forest purposes - Applicable to subprojects located in forests; requires prior permission to take up the works
a.	Forest (Conservation) Rules, 1981 amended 1992 and 2003.	Rules for conversion / use of forest lands for non-forest purposes	MOEFCC West Bengal Forest Department	- Applicable to subprojects located in forest lands; - Prior permission for the use of forest land for program is required from WBFD/MOEFCC
b.	Guidelines for diversion of forest lands for non-forest purpose.	-Provides operational guidelines under the above rules for conversion / use of forest lands for non-forest purposes: approval of MOEFCC for any acquisition of forest land; - Application for the use of forest land to be made to the Forest Department, GOWB; - Project proponent to identify non-forest land which is to be transferred to Forest Department for taking up afforestation program; - Net present value of the forest land to be used, cost of afforestation, tree cutting, etc. to be paid to Forest Department	MOEFCC West Bengal Forest Department	Guidelines to be followed if any subprojects require conversion of forest land for project (non-forest) purpose
8.	The Major Port Trusts Act, 1963 (Kolkata Port Trust, KoPT)	Prior permission of KoPT Board is required for any construction, mooring, reclamation etc., in port limit and port approaches; the port limit includes River Hooghly and shore and land area within 45.7 m of High Water Mark and extends from Jangipur in the north (in Murshidabad District) to Sandheads in the south (near Bay of Bengal) -Detailed study by designated institutes is a prerequisite of KoPT for any permission -Construction of deep tube wells restricted in said area -As per a National Green Tribunal (NGT) order, EIA Study and EMP is required for any construction in Hooghly River stretch from Nazirganj to Bally Khal (western/Howrah side) and Tollygunj to Dakhineswar (eastern/kolkata side); EIA to be conducted accredited by consultant but Environmental Clearance not required.	Kolkata Port Trust	-all the intakes in River Hooghly (Ganges), and any works in port limit (as defined) will require prior permission from KoPT (See Appendix 5) -No objection of Inland Waterways Authority of India is required for any construction in Hooghly (not under this Act)
9.	Ancient Monuments and Archaeological Sites and Remains Acts, 1958, its Rules,1959 and	Act for better and effective preservation of the archaeological wealth of the country, on par with constitutional provisions This Act provides for the preservation of ancient and historical monuments and archaeological sites and remains of national importance, for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects.	ASI	- Applicable to subprojects located in proximity of the protected monuments/ sites; - There are134 nationally protected monuments in 16 districts of West Bengal; most

Ref.	Legislation	Policy Description	Regulator	Applicability
	notification, 1992. Ancient Monuments and Archeological Sites and Remains (Amendment and Validation) Act, 2010	- Notifies 100m around the monument as prohibited area and 100 to 300m as regulated area for construction works; - No excavation/construction work is allowed within 100m of boundary of the protected monument; - Requires prior permission of Archaeological Survey of India (ASI) for taking works within 100-300 m of the boundary of protected monuments		(33 nos) are in Bankura followed by Murshidabad (22 nos) and Malda (21 nos) districts (Appendix 6)
10.	Contract Labour (Regulation and Abolition) Act, 1970; .	The Act provides for certain welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law. The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor.	Chief Labour Commissioner, Government of West Bengal	- Applicable to all construction works under WBDWSI - PHED/PMU to obtain a Certificate of Registration as the principle employer;
11..	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996.	All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay Cess at rate not exceeding 2% of the cost of construction as may be notified by the Government. The employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc. The employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government - Cess should be paid at a notified rate; -The employer has to obtain a registration certificate from the Registering Officer	Chief Labour Commissioner, Government of West Bengal	- Applicable to any building or other construction work employing 10 or more workers; - provide safety measures at the construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc.
12.	The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc	Chief Labour Commissioner, Government of West Bengal	- Contractor shall register with Labour Department if Inter-state migrant workmen are engaged - Adequate and appropriate amenities and facilities to be provided to workers - housing, medical aid, traveling expenses
13.	The Child Labour (Prohibition and Regulation) Act, 1986.	The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of child labor is prohibited in Building and Construction Industry.	As above	- No child labour shall be employed
14.	Minimum Wages Act, 1948.	The employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a	As above	- All construction workers should be paid not less than

Ref.	Legislation	Policy Description	Regulator	Applicability
		scheduled employment. Construction of Buildings, Roads, Runways are scheduled employment.		the prescribed minimum wage.
15.	Workmen Compensation Act, 1923.	The Act provides for compensation in case of injury by accident arising out of and during the course of employment.	As above	- Compensation for workers in case of injury by accident.
16.	Equal Remuneration Act, 1979.	The Act provides for payment of equal wages for work of equal nature to Male and Female workers and not for making discrimination against Female employees in the matters of transfers, training and promotions etc.	As above	- Equal wages for work of equal nature to male and female workers.
B	**State Level**			
1	West Bengal State Water Policy	-Prepared in accordance with the National Water Policy, to ensure equitable, economic and optimal use of water. One of its objectives is to "make available safe drinking water to all by 2020" -Policy document observes that, "Demand of water uses for various purposes is ever increasing due to the growth process and expansion of economic activities". "Policy recognizes increase in water demand for drinking, power and industry sectors, and requirement of water in rivers for ecological and as well as for water transport systems. -Policy aims to achieve efficiency in utilization; water allocation priorities: (i) Drinking Water, (ii) Irrigation, (iii) Industry, Power, (iv) Hydro-Power, (v) Navigation and ecology.	-Irrigation and Waterways Department (IWD)of GOWB is mandated to allocate/ permit abstraction	-Project requiring abstraction of water from river require permission of IWD.
2.	Notification on Air Pollution, Department of Environment, GOWB, March 2010	-Issued under the Air Act, 1981) -Prohibits use of diesel generators not confirming to standards laid down by MOEFCC WBPCB to issue CTE only to generators that fully comply with air and noise pollution control system procure generators that comply with the standards, and obtain CTE	WBPCB	Procure generators that comply with the standards, and obtain CTE
3	Direction of West Bengal Department of Environment under the Air Act, 1981 Direction No. EN/3170/T-IV-7 /001/2009 dated: 10 December 2009	- issued based on a study by WBPCB with help of ADB on air pollution from construction activities - lays out norms for control of air pollution from construction activities - prescribes two sets of norms: preventive measures, and practices to be discarded (Appendix 7) - failure to comply will lead to legal action, stoppage of work and imposition of `Pollution Cost'. -All construction activities under WBDWSIP shall follow the norms	WBPCB	Compliance to the norms in project implementation by all parties (contractors, including any subcontractors, and PHED)
4	West Bengal Ground Water Resources (Management, Control and Regulation) Act, 2005'	-To manage, control and regulate indiscriminate extraction or use - West Bengal State Level Ground Water Resource Development Authority (WBSLGWRDA)was established under this act; State Water Investigation Directorate is its functional organ -Permission of Authority is mandatory to construct ground water extraction structures (operated by engine or motor driven pump)	WBSLGWRDA	-all groundwater intakes proposed under WBDWSIP will require permit from the Authority
5	West Bengal Inland Fisheries Act, 1984	-Act to conserve, develop, propagate, protect, exploitation of inland fish and fisheries -No discharge of wastewater, pollutants into inland water bodies that may affect	Department of Fisheries	Project sites located in such areas will require prior permission

Ref.	Legislation	Policy Description	Regulator	Applicability
		fish -Prohibits conversion of fishery area (any water area, naturally or artificially depressed land, irrespective of ownership, measuring 0.035 ha or more, which retains water for more than 6 months and capable of being used as fishery) for any other purpose -prohibits filling up fishery areas to convert into solid land, eg., for any construction -Prohibits dividing water area into parts to make any part less than 0.035 ha -if conversion/ filling up is for development works, prior permission is required		
6	East Kolkata Wetlands (Conservation and Management) Act, 2006	- Act for conservation and management of EKW spreading over 12,500 ha in Kolkata, North and South 24 Parganas Districts -EKW Management Authority is constituted under this Act to conserve wetlands, to make rules, enforce land use controls and regulate all activities; prior permission of the Authority is required to conduct any project activities in the notified area	EKW Management Authority	-Project activities, if any, located in EKW area will require prior permission. (Appendix 8 provide EKW map and geographical area)
7.	West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006 and Rules, 2007	Cutting of trees in non-forest land, irrespective of land ownership, requires permission from local administration (Forest Department for protected species, sacred groves). - Prior permission required to fell trees in non-forest (private or otherwise) lands - 2 trees to be planted in the same premises for each tree that is cut - Permission from the Divisional Forest Officer (Utilization Division), Forest Directorate, will be required if trees are: sacred groves, endangered species, or with heritage status	Designated officer of local body / Divisional Forest Officer, GOWB	-Subproject that require tree cutting shall obtain permission and undertake replantation
8.	West Bengal Action Plan on Climate Change	- Water resources are one of the major component dealt in detail in the action plan - It highlights the regional variation in terms of water availability, demand, quality etc., considering the likely changes in rain fall, temperature, blue water flow, green water flow and green water storage - Suggests various region-wise strategies, action plan for water resource management; PHED is one of the agencies responsible for implementation of the action plan	Not applicable	- WBDWSIP shall consider these strategies in subproject design
9.	West BengalPreservation of Historical Monuments and Objects and Excavation of Archaeological Sites Act, 1957.	-State government notifies monuments, objects, and excavation sites as state protected under this -Construction activities within the notified areas of each monument are regulated	Directorate of Archaeology and Museums, GOWB	-any project activities located in such notified area will require prior permission
10	The West Bengal Building and Other Construction Workers'	- regulate the employment and conditions of service of building and other construction workers and to provide for their safety, health and welfare measures. - Established West Bengal Building and other Construction Workers' Welfare	Chief Labour Commissioner, Government of West Bengal	-To be complied in project implementation

Ref.	Legislation	Policy Description	Regulator	Applicability
	(Regulation of Employment and Conditions of Service) Act, 1996 and Rules, 2004	Board as per the Act - Provide various benefits for the registered workers		

B. International Environmental Agreements

30. India is a party to various international agreements and conventions related to environment, which include the following:

(i) **Ramsar Convention on Wetlands of International Importance, 1971**. Known as Ramsar Convention, it is an intergovernmental treaty for the conservation and sustainable utilization of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value. It provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Ramsar Convention is the only global environmental treaty that deals with a particular ecosystem. There are 26 wetlands in India which are designated as wetlands of international importance under this.

(ii) **Convention on Protection of the World Culture and Natural Heritage, 1972**. Adopted by United Nations Educational, Scientific and Cultural Organization (UNESCO) in in 1972. Signatory country pledges to conserve the cultural and natural sites within its borders that are recognized by the Convention as being of exceptional and universal value. In return, the international community helps to protect these treasures. India is a signatory to the convention. To define these significant sites the Convention has established the World Heritage List. There are 35 (27 cultural, 7 natural and 1 mixed) World Heritage Sites in India.

(iii) **UNESCO World Network of Biosphere Reserves**. UNESCO has introduced the designation 'Biosphere Reserve' for natural areas to minimize conflict between development and conservation, and established this network under the Man and Biosphere Program, which currently composted of 669 biosphere reserves in 120 countries, including 16 transboundary sites. It works to foster the harmonious integration of people and nature for sustainable development through participatory dialogue, knowledge sharing, poverty reduction, human well-being improvements, respect for cultural values and by improving society's ability to cope with climate change. It promotes collaboration and represents a unique tool for international cooperation through the exchange of experiences and know-how, capacity-building and the promotion of best practices. There are 18 biosphere reserves in India, of which 8 are designated by UNESCO in World Network of Biosphere Reserves (WNBR). Sundarbans Biosphere Reserve in West Bengal is one of UNESCO designated Biosphere Reserves (Sundarbans Map is given Appendix 9). No works will be conducted in the Sundarban areas, except for small civil works in one block of 24 South Paragas where the site for GLSR and small pipes are in the outer periphery of the transition zone. The project preparatory team has noted that the site and alignment are developed areas and construction is allowed. No works will be allowed beyond this location. The project will not consider any components in the core area.

(iv) **Convention on the Transboundary Movements of Hazardous Wastes and Their Disposal, 1989.** Convention to protect human health and the environment against the adverse effects of hazardous wastes. This aims at (i) reduction of hazardous waste generation, promotion of environmentally sound management (ii) restriction of transboundary movements, and (iii) a regulatory system for transboundary movements.

(v) **United Nation Convention to Combat Desertification.** Signed in 1994 and entered into force in 1996, this convention aims to combat the desertification and mitigate the effects of drought through national action programs that incorporate

long-term strategies supported by international cooperation and partnership arrangements. As an impact of this treaty, the year 2006 was declared as "International Year of Deserts and Desertification" to spread awareness about the desert areas of the world and especially the problem of desertification.

(vi) **The Convention on Biological Diversity**. Commonly referred to as the Biodiversity Treaty, 1992, defines biodiversity as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems." Parties to the Biodiversity Treaty "affirm sovereign rights over the biological resources found within their countries, while accepting responsibility for conserving biological diversity and using biological resources in a sustainable manner".

(vii) **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 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.

(viii) **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. 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.

(ix) **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. 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. 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.

(x) **United Nations Framework Convention for Climate Change**. The UNFCCC objective is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. India signed the UNFCCC in 1992 and ratified in 1993. The framework set no binding limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms. Instead, the framework outlines how specific international treaties (called "protocols" or "Agreements") may be negotiated to set binding limits on greenhouse gases. The Ministry of Environment, Forest and Climate Change (MOEFCC) is the nodal agency for climate change issues in India.

(xi) **The Kyoto Protocol** to the UNFCCC was adopted in 1997 that commits State Parties to reduce greenhouse gas emissions, based on the premise that (a) global

warming exists and (b) human-made CO_2 emissions have caused it. Developed countries and economies in transition listed in Annex B of the Protocol, to reduce their GHG emissions by an average of 5.2% below 1990 levels. Article 12 of the Kyoto Protocol provides for the Clean Development Mechanism (CDM). India acceded to the Kyoto Protocol in 2002. India has taken various initiatives to improve understanding of climate change, and comply with the requirements of the UNFCCC.

(xii) **Paris Agreement**. The Paris Agreement to the UNFCCC deals with greenhouse gases emissions mitigation, adaptation and finance starting in the year 2020. The contribution that each individual country should make in order to achieve the worldwide goal are determined by all countries individually and called "nationally determined contributions" (NDCs). India signed convention in April 2016 and ratified in October 2016.

31. WBDWSIP subprojects if located in or near the sites notified under the Ramsar convention, World Heritage Sites, Biosphere reserves, will need to comply to the provisions and/or respective site management plans drawn up as per the convention guidelines. As these sites also enjoy protected sites under Government of India legislations, the international requirements will also be considered by the government regulatory agencies during the clearance/permission process. On climate change conventions, WBDWSIP will be designed, constructed and operated with minimal greenhouse gas emissions and infrastructure be built as climate resilient as far as possible.

Table 3: International Agreements and Applicability to WBDWSIP

International Agreement	Applicability to West Bengal Drinking Water Sector Improvement Project and Specific Requirements
Ramsar Convention on Wetlands of International Importance, 1971.	- East Kolkata Wetland is a designed Ramsar wetland (wetland of international importance) - any of the activities to be undertaken in the proximity of Ramsar wetlands shall follow the guidelines of the convention (The Ramsar Convention Handbooks for the wise use of wetlands, 4th ed. (2010), (http://www.ramsar.org/cda/en/ramsar-pubs-handbooks/main/ramsar/1-30-33_4000_0__)
Convention on Protection of the World Culture and Natural Heritage, 1972	- The Sundarbans National Park, the largest estuarine mangrove forest in the world is a World Heritage Site located in Ganges river delta bordering the Bay of Bengal, in West Bengal. -Implementation of any developmental activities in World Heritage sites shall comply with the comprehensive management plan of such site
UNESCO World Network of Biosphere Reserves (WNBR)	-Sundarbans is designated as Biosphere Reserve in 1989 by Government of India and by UNESCO in 2001 as part of WNBR. - Sundarbans Biosphere Reserve consists of 3 zones: Core zone is securely protected site for conserving biological diversity. Buffer Zone surrounds/ adjoins the Core Zone, and is used for activities compatible with sound ecological practices. Transition zone contain a variety of agricultural activities, settlements and other uses. -Projects within Biosphere Reserve will be dealt within the ambit of forest, wildlife laws etc., as applicable; and activities shall comply with the Biosphere Management Plan

UNESCO = United Nations Educational, Scientific and Cultural Organization, WNBR = World Network of Biosphere Reserves.

C. ADB Safeguard Policy Statement's Environmental Requirements

32. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments.

33. **Screening and Categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the

type and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories:

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

34. **Environmental Audit of Existing Facilities**. ADB SPS requires an environmental audit, if a subproject involves facilities and/or business activities that already exist or are under construction, including an on-site assessment to identify past or present concerns related to impacts on the environment. The objective of this compliance audit is to determine whether actions were in accordance with ADB's safeguard principles and requirements for borrowers/clients, and to identify and plan appropriate measures to address outstanding compliance issues.

35. **Environmental Management Plan.** An EMP, which addresses the potential impacts and risks identified by the environmental assessment, shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.

36. **Public Disclosure.** ADB will post the safeguard documents on its website as well as disclose relevant information in accessible manner in local communities:

(i) for environmental category A projects, draft EIA report at least 120 days before Board consideration;
(ii) final or updated EIA and/or IEE upon receipt; and
(iii) environmental monitoring reports submitted by the implementing agency during project implementation upon receipt.

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

Table 4: Applicable WHO Ambient Air Quality Guidelines

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

Table 5: World Bank Group's Noise Level Guidelines

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

D. Compatibility between Country's and ADB Safeguard Policy

38. The ADB environmental safeguard policy principles are encompassed entirely in SPS. Government of India has different but robust environmental legislative framework, embedded in various Acts, Policies, Rules and Regulations. While the ADB SPS is in line with the multilateral development financing institutions, Government's policies are also comparable to international environmental framework including that of ADB. Government's environmental regulatory framework derived from Constitutional Provisions; the National Environmental Policy, 2006 is a comprehensive policy document, addresses all relevant aspects of environmental protection and conservation, environmental sustainability and enforcement. The Environmental (Protection) Act,

1986 and its Rules, Notification, Standards, etc., have created robust regulatory framework. Besides, there are parallel and complementing legislations dealing with specific aspects like forest, wildlife, pollution control, archeological conservation, etc.

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

40. The water supply projects, including that are implemented under WBDWSIP are not listed in the EIA Notification, 2006 and therefore do not require EIA study or Environmental Clearance. However, may require clearances / permission under other legislations if the project location is sensitive or notified. Such as if a project is in forest lands or near protected monuments, it will require approvals as per those regulations. Water Treatment Plants require consent to establish and consent to operate from WBPCB.

41. Per ADB SPS, WBDWSIP subprojects are likely to be classified as B as these are unlikely to have significant adverse impacts. As such, no A category projects will be considered for funding under this project. It is therefore required that proposed subprojects are subjected to screening, categorization, and preparation of IEEs and EMPs.

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

Table 6: Comparative Government and ADB Safeguard Requirements

Subproject	Government Regulatory Requirement	ADB Requirement	Gap
(1)	(2)	(3)	(4)
All subprojects of water supply, sewerage and sanitation	**Environmental Impact Assessment (EIA) Notification, 2006** **Not applicable** (None are listed activities/projects in Schedule I of EIA Notification, 2006. Do not require Environmental Clearance from MOEFCC. No EIA, public consultation, disclosure required). *As per National Green Tribunal (NGT) Order, EIA study is required for any work proposed in notified stretch of River Ganga (Hooghly) near Kolkata. it will not, however, require Environmental Clearance under the EIA Notification, but EIA study and EMP is prerequisite for getting clearance from Kolkata Port Trust which is regulatory authority of port and port approaches that include almost entire stretch of Ganges River in the state of West Bengal.*	**Safeguard Policy Statement 2009** Classify the project using rapid environmental assessment (REA) checklist. Categorization (A/B/C). Projects will mostly be classified as B. Category A projects will be excluded from WBDWSIP. Preparation of initial environmental examination (IEE) For projects involving facilities and/or business activities that already exist or are under construction, undertake an environment compliance audit. Where non-compliance is identified, a corrective action plan is required. Public consultation in a manner commensurate with the impacts, process and its results are to be documented and reflected in the IEE.	WBDWSIP subprojects do not require EIA study as per Government of India regulations whereas ADB SPS 2009 requires the process of screening, environmental assessment, public consultation, disclosure, etc., for all projects. Conduct environmental assessment complying with the ADB SPS 2009
Water supply subprojects with WTP	**Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments** **Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.** **Applicable to WTP component –** requires consent to establish (CTE) and consent to operate (CTO) from WBPCB Detailed Project Report to be submitted to WBPCB along with the form (combined form for Air and Water Acts) and prescribed fee. **CTE**. Based on project review and site inspection WBPCB provides CTE before construction, and stipulate the disposal standards to be met **CTO**. CTO issued prior to start of operation, after confirming compliance with CFE conditions, if any	Disclosure on ADB's website of the final IEE; updated IEEs and corrective action plans; and environmental monitoring reports. Public disclosure (complete IEE) in an accessible place and local language. Mitigation measures specified in IEE incorporated in project design; incorporate mitigation and monitoring measures (including the EMP) into bid/contract documents. ADB approval of IEE prior to invitation of bids All necessary government approvals/clearances should be in place prior to award of contracts Implementation of EMP; corrective action plans in case of non-compliance	**No gap** As per the ADB all projects must comply with the country environmental regulations to be eligible for funding. WBDWSIP projects shall comply with all environmental regulations and the consents, clearances, approvals, as required for subproject should be obtained.

Subproject	Government Regulatory Requirement	ADB Requirement	Gap
(1)	(2)	(3)	(4)
	Renewal of CTO. Based on the performance of the WTP and its compliance with the disposal standards CTO is renewed every two/three years Disposal standards are notified under the **Environment (Protection) Act, 1986 and CPCB Environmental Standards.** Appendix 1 provides applicable standards.	Submission of semi-annual monitoring report and disclosure SPS 2009 covers all the aspects of pollution control SPS also requires that all subproject should comply with county safeguard policies In project implementation, 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 shall be applied. When Government regulations differ from these levels and measures, project shall achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, provide full and detailed justification-	
All subprojects.	**Noise Pollution (Regulation and Control) Rules, 2000 amended up to 2010** Rule 3 of the Act specifies ambient air quality standards in respect of noise for different areas/zones. **Appendix 1** provides applicable noise standards. **Construction and Demolition Waste Management Rules, 2016** Rule 4 and 5 specifies the duties of waste generator, and duties of service provider and their contractors. These are to be followed during the construction (Appendix 9)		**No gap** As per the ADB all projects must comply with the country environmental regulations to be eligible for funding. WBDWSIP projects shall comply with all environmental regulations and the consents, clearances, approvals, as required for subproject should be obtained.
All Subprojects	**Direction of West Bengal Department of Environment under the Air Act, 1981 Direction No. EN/3170/T-IV-7 /001/2009 dated: 10 December 2009** - lays out norms for control of air pollution from construction activities (Appendix 7)		-Same as above-
Subprojects intake construction in Hooghly River	**The Major Port Trusts Act, 1963 (Kolkata Port Trust, KoPT)** **-** KOPT permission is mandatory for any works in Hooghly river and banks		Same as above-
Subprojects located within 300 m of	**Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and**	SPS 2009 requires that all the impacts on archeological, historical and cultural resources shall duly be covered in environmental assessment	-Same as above-

Subproject	Government Regulatory Requirement	ADB Requirement	Gap
(1)	(2)	(3)	(4)
protected monument	**Remains (Amendment and Validation) Act, 2010** Works within 300 m boundary of the monument can be done only with prior permission of ASI. Application in prescribed format to be submitted to ASI for permission.		
Applicable to subprojects located within core or buffer zone of Protected Areas	**Wildlife Protection Act, 1972** It is unlikely that any project located within protected area is included in the project Permission from chief wildlife warden/ State Wildlife Board/ National Board of Wildlife	SPS 2009 requires that all impacts related to environmental sensitive areas (forest, protected areas etc.,) and wildlife are duly be covered in the environmental assessment	-Same as above-
Subprojects located in forest lands	**Forest (Conservation) Act, 1980 amendment 1988 and the rules/notifications** Prior permission to use forest land for non-forest (project) purposes	-same as above-	-Same as above-
All subprojects	**Labour laws** Contractor shall register with the state labour department and comply with the provisions, in terms of minimum wages, equal wages for men and women, no child labour, inter-state labour, working conditions, amenities to be provided etc.	SPS 2009 requires due consideration of occupational health and safety impacts in environmental assessment, and mitigation measures During the design, construction, and operation of projects funded by ADB, practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines shall be followed.	As per the ADB all projects must comply with the country environmental regulations to be eligible for funding. Therefore, WBDWSIP projects shall comply with all labour laws (central and state). Following IFC EHS guideline[a] during implementation

[a] World Bank Group. IFC Sustainability Webinar Series. Environmental Health & Safety Guidelines 101.

E. Institutional Capacity in Environmental Safeguards

43. **PHED** is the executing and implementing agency. A PMU set up within PHED exclusively for the WBDWSIP will be implementing the project. PMU will be supported by district level PIUs.

44. The existing technical staff of PHED includes civil, water resources and environmental engineers, and scientists/chemists engaged in water quality testing laboratories. Under the current government regulations, there is no need to conduct EIA studies or prepare EIA reports and EMPs, and therefore the capacity of PHED to deal with environmental assessment studies and the preparation of an EIA is limited. Consideration of safeguard aspects in PHED is limited to compliance with government regulations as per the government law, and obtaining necessary clearances, like consent from WBPCB for WTPs. Consequently, at present, there is no institutional set-up within the PHED to specifically deal with environmental safeguard aspect.

45. PHED is currently implementing a water supply project in Purulia district, funded by bilateral agency Japan International Cooperation Agency (JICA) to provide water supply to over a million population. PHED is implementing this through a PMU specifically established for the project. The safeguard policies of JICA are similar to that of any other development funding agencies like ADB and World Bank. Due to lack of in house capacity in safeguards, these safeguard tasks in the project is handled by specialist consultants, and are project specific and there is institutional set up created specifically for environmental safeguards.

46. **WBPCB** is the main state-level regulatory agency responsible for environment protection and pollution control in West Bengal. WBPCB through its 11 Regional Offices across the state regulates environmental protection related activities. The involvement of the WBPCB in monitoring of the environmental safeguards of WBDWSIP activities is limited, and mainly include issuance of consent, and monitoring of compliance of WTPs and air pollution from project activities during construction. Nevertheless, WBPCB mandate covers overall pollution control and WBPCB deals with public complaints related to pollution and environmental degradation due to any activity.

47. **Forest and Wildlife.** Robust implementation and enforcement system exists for protected areas., and for use of forest lands for non-forest purposes (e.g., for locating project components in forests). The process is cumbersome and time consuming that rightly discourages the location of projects in forestlands unless it is unavoidable. In WBDWSIP, there may cases where linear components like raw water mains may have to transverse through forest lands. Forest clearance is issued by MOEFCC. Area less than 40 hectares is cleared by regional office of the MOEFCC at Bhopal, while the rest are cleared by MOEFCC at Delhi. Conversion of forest lands that are part of protected areas (PAs) - National Parks/Sanctuaries and Tiger Reserve areas (notified under Indian Wildlife (Protection) Act, 1972) is not permitted. In exceptional case, the State Government requires consent and approval of the National Board for Wildlife and the Supreme Court. No project facilities will be in the protected areas. Eco-sensitive zones (ESZ) are notified around the PAs to act as transitions zone by regulating and managing the activities around the PAs. However, in West Bengal, ESZs are not notified for all Pas yet. General guideline is that ESZ shall be about 10 km around a PA, however, it is flexible and depending on the site-specific condition it can vary. Therefore, any work within ESZ or 10 km (if ESZ not notified) from the boundary of the national park shall be implemented only after consultation with the respective authorities of the protected area.

III. ANTICIPATED ENVIRONMENTAL IMPACTS

48. An environmental impact is defined as any change to the environment, whether adverse or beneficial; resulting from activities, products or services. To ensure project sustainability, acceptability, and to enhance efficiency, it is required that environmental impacts are identified and assessed as part of the planning and design process, and that actions are taken to avoid those impacts, and if cannot be avoided, reduced and mitigated to acceptable levels.

49. WBDWSIP will finance water supply projects in the selected districts of West Bengal, which are affected with poor groundwater quality, primarily with arsenic or fluoride contamination. Subprojects include source development, water treatment, raw water and clear water transmission, storage, distribution to consumers via individual connections. Draft IEEs have been prepared for 4 priority subprojects in 3 districts and concluded that there projects are unlikely to have any significant adverse impacts.

50. While there would be numerous positive benefits in terms of improving quality of life of people as well as raising standards of both individual and public health, WBDWSIP projects may also induce certain negative impacts as provision of the water supply will involve physical interaction with the environment. Drawing from the environmental assessment of sample subprojects and based on broad range of issues listed in the ADB rapid environmental assessment (REA) checklists that determine project environmental category, Table 7 provides a summary of negative potential environmental impacts which may arise during WBDWSIP implementation and general measures to mitigate those impacts to acceptable levels. These are indicative impacts, and will need to be further explored during detailed engineering design phase of each subproject.

51. No category A type of works (with significant adverse impacts) are anticipated. Subprojects likely to have potentially significant adverse impacts (categorized as A) will not be funded under WBDWSIP.

52. **Impacts Due Location and Design.** Almost all of the design impacts can generally be mitigated while there can be significant impacts if the components will be located in environmentally-sensitive areas (in or near wildlife sanctuaries, national parks, forest areas, wetlands, etc.),[6] or in or near physical cultural resources (protected monuments/sites or world heritage sites).[7] WBDWSIP will not undertake activities within such sensitive areas and will exclude projects which will cause significant environment impacts[8] such as construction of dams and reservoirs. Most of the facilities will be in government owned vacant unused lands, and where not possible, lands will be purchased from private parties on willing buyer willing seller principle at prevailing market rate. Pipelines will be laid along public roads, avoiding sensitive areas like forests. Tree cutting will be minimized. Locating components obstructing/encroaching natural drainage channels, ponds etc., will significantly impact natural drainage pattern and may lead to water logging and flooding, and related public health issues.

53. The main design impact of water supply system in general are due to abstraction of water and quality of raw water. Current water supply in the project districts is groundwater based and given the poor groundwater quality, which if unfit for drinking, the state government policy is to

[6] West Bengal is blessed with rich natural resources. Forests cover about 14% of the state, which are mostly concentrated in south/southeast and northern parts of the state. There are 6 national parks, 15 wildlife sanctuaries and a biosphere reserve in the state (Appendix 3 and 4).

[7] There are 134 protected monuments including a world heritage site (Appendix 6).

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

move to safe and sustainable surface water sources. Therefore, WBDWSIP will mostly design surface water-based water supply systems – either new river intakes or drawing water from existing dams/reservoirs. Therefore, creation of new infrastructure to extract groundwater will be limited to areas where there are no surface water sources, and where it is possible to provide safe drinking water from the groundwater source. WBDWSIP will depend on flowing rivers (abstracting directly by a river intake without creating any dam/bund across the river), or utilize existing dams/reservoirs to abstract raw water. No new dams/reservoirs will be developed. Source sustainability will be established, and downstream impacts, and user conflicts will be assessed and the same will be mitigated/avoided. Raw water quality will be carefully analyzed, and appropriate design and monitoring measures will be put in place to ensure that water supply to consumers always meet the drinking water standards. Planning principles and design considerations will be reviewed and incorporated into the site planning and design process wherever possible

54. **Impacts Due to Construction**. Most impacts of WBDWSIP will result from considerable construction activities. Water pipelines will be laid along the public roads, while construction activities of other components like tanks, WTP etc., will be confined to the selected sites, and the interference with the public and community around is minimal. There will be temporary negative impacts, arising mainly from construction dust and noise; hauling of construction material, waste and equipment on local roads (traffic, dust, safety etc.,), mining of construction material, occupation health and safety aspects. During the construction phase of pipeline, impacts arise from the invasive nature of excavation and trenching work along the public roads used by traffic, pedestrians etc., and may disturb residents and businesses adversely affecting the livelihoods However as most of the individual elements are relatively small and involve straightforward construction, the potential environmental impacts (i) will be mainly localized, temporary and not greatly significant; (ii) will not cause direct impact on biodiversity values and (iii) are common impacts of construction in public areas, and there are well-developed methods for their mitigation.

55. **Impacts Due to Operation and Maintenance**. Anticipated impacts of water supply projects during operation and maintenance (O&M) will be related to operation of WTP, handling and application of chlorine, operation of pump houses, and repair and maintenance activities. Provisions will be made in the design: to recirculate wastewater from WTP; collect, thicken and dispose sludge; chlorine safety; use energy efficiency equipment, etc., Water supply system will need to be operated using the standard operating procedures following an operating manual. Application and handling of chlorine gas will involve certain risks, and appropriate measures for safe application including safety measures and equipment, PPEs, awareness programs and mock drills will need to be included. Thus, considering the design and operational procedures that will be considered in implementation, it is unlikely that there will be any significant negative impacts due to operation of water supply system. Routine repairs and maintenance works will be very small in scale, to conducted manually by small teams and works will be very short thus will not cause significant physical impacts.

56. Therefore, WBDWSIP is unlikely to cause significant adverse impacts, provided project sites are carefully selected and components designed, constructed and implemented with due consideration to potential negative impacts. Project will provide significant benefits to citizens of West Bengal, and will improve public health and economy.

Table 7: Potential Environmental Impacts and Risks

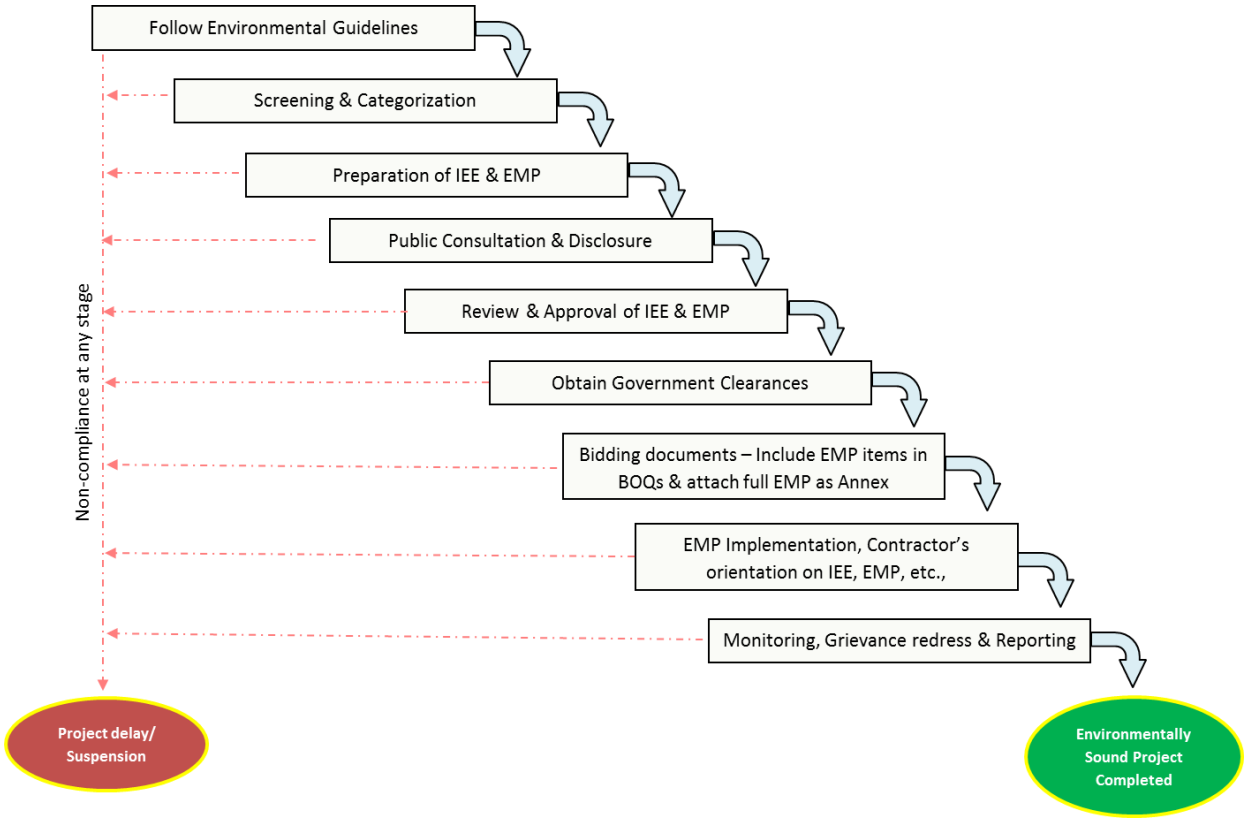
Anticipated Impacts	General Mitigation Measures
Design Period	
Loss or damage to environmentally-sensitive areas	• Avoid locating components in or near environmentally-sensitive areas. • Design surface water intake structures to minimize impacts on aquatic life. Limit maximum through-screen design intake velocity to limit entrainment of aquatic organisms • If there are threatened, endangered, or other protected species within the hydraulic zone of influence of the surface water intake, ensure reduction of impingement and entrainment of fish and shellfish by the installation of technologies such as barrier nets (seasonal or year-round), screens, and aquatic filter barrier systems
Impairment of physical cultural resources (PCRs)	• Avoid locating components in or near physical cultural resources. If cannot be avoided, consult with Archaeological Survey of India (ASI) (for ASI-protected PCRs) or State Archaeological Department (for state-protected PCRs) • Develop "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered
Pollution of source water from upstream anthropogenic activities and soil erosion runoff	• Conduct extensive sanitary survey to avoid locating new water supply sources downstream of pollution sources (sewage and/or drainage outfall, catchment of area of extensive agricultural activities/nutrient runoff, waste dumpsites, pit latrines, toilets, or sewerage treatment plant discharge point)
Impacts due to excessive/unsustainable groundwater extraction (land subsidence, degradation of water quality, etc.)	• Conduct groundwater tests to estimate the sustainable yield • Utilize existing dams/reservoirs as water source subject to technical and economic feasibility • Modify extraction rates and locations as necessary to prevent unacceptable adverse current and future impacts, considering realistic future increases in demand.
Impacts due to excessive/unsustainable surface water withdrawal	• Evaluate potential adverse effects of surface water withdrawal on the downstream ecosystems and use appropriate environmental flow assessment to determine acceptable withdrawal rates.
Risk of pollution of source water due to inadequate protection of intake works or wells	• Develop water source protection plan. It is important to involve the ULB, water regulating authorities, property owners, farmers, industry (if present in the ULB), businesses, community groups, and public health officials. • Locate new facilities at sites where there is low risk of flooding or other hazards that might impair functioning of, or present a risk of damage to water treatment plants, tanks/reservoirs, or their environs.
Health impacts due to unsatisfactory water supply	• Follow design criteria in the Ministry of Urban Development (MoUD's) Central Public Health and Environmental Engineering Organization (CPHEEO) Manual on Water Supply and Treatment
Social conflicts from abstraction of raw water for water supply from other water uses of same surface/groundwater sources	• Avoid sources with such conflicts; if unavoidable Water Resource Review Committee to initiate dialogue and resolve issues before investments
Health risks (carcinogenic dusts) due to replacement of existing asbestos cement pipes	• Avoid any repairs or new connections to/from existing asbestos cement pipes • No Asbestos Cement pipes to be used
Social conflicts arising from displacement of communities	• Avoid land acquisition to maximum extent possible. For potential involuntary resettlement impacts, prepare a Resettlement Plan
Disturbance of services due to shifting of utilities (electric poles, wires, water pipes, etc.)	• Ensure all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosures
Construction Period	
Noise and vibration from construction activities	• Schedule noisy or otherwise invasive activities during periods of the day which will result in least disturbance • Use of high noise generating equipment shall be stopped during night time. • In unavoidable case of night works (due to local rules) provide prior information to public on work schedule, noisy activities and need to conduct the works at work. Use best construction methods to minimize noise to possible extent. • Vehicle horns should not be used unless it is necessary

Anticipated Impacts	General Mitigation Measures
	• All vehicles and equipment to be used in construction shall be fitted with exhaust silencers. • Use silent-type generators (if required) • If it is not practicable to reduce noise levels to or below noise exposure limits, post warning signs in the noise hazard areas. • Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly
Increased dust from construction activities	• Use dust control methods, such as covers, water suppression, or increased moisture content for open materials storage piles • Use of water suppression for control of loose materials on paved or unpaved road surfaces. Ensure unpaved surfaces used for haulage of materials within settlements are dust-free
Increase in vehicle-related pollutants	• Use modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions, and ensure that these are maintained to manufacturers' specifications at all times.
Continuing soil erosion/silt runoff in or near construction sites	• Measures to minimize soil erosion/silt runoff to be incorporated when conducting earthworks during monsoon season
Water and land chemical contamination from fuels and lubricants	• Place storage areas for fuels and lubricants away from any drainage leading to water bodies
Water and land contamination from solid and liquid wastes	• Prioritize re-use of excess spoils and materials in construction activities. • Take all precautions to prevent entering of wastes into streams, watercourses, fisheries ponds or irrigation systems • Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas
Increased road traffic in the town due to construction activities	• Prepare traffic management plan and ensure sufficient financial provisions for road restoration
Road blocking/closure due to excavation works	• Ensure effective advance communications with the affected residents • Prepare traffic management plan • For affected livelihood, prepare a resettlement plan
Social conflicts between construction workers from other areas and community workers	• Employ labor force from local communities to maximum extent possible • Restrict activities and movement of staff only within designated construction areas.
Safety risks due to deep excavation (workers and public)	• Prepare health and safety plan • Prepare community awareness plan. Consult with local community to inform them of the nature, duration and likely effects of the construction work, and to identify any local concerns so that these can be addressed. • Provide sign boards
O&M Period	•
Health impacts due to unsatisfactory raw water supply	• Conduct water quality monitoring at intake, water treatment plant and at strategic points in the distribution system • Ensure standard water quality surveillance procedures and protocols as a key obligation of the Contractor with third party checks
Health and safety hazards to workers from the handling of chlorine and public safety risks from accidental leakage of chlorine gas	• Prevent, minimize, and control potential impacts associated with the storage, handling and use of disinfection chemicals (e.g., chlorine) • Minimize the amount of chlorination chemicals stored on site while maintaining a sufficient inventory to cover intermittent disruptions in supply • Ensure that all site personnel have a basic level of health and safety training and protective equipment
Safety risks due to pipe repairs (workers and public)	• Provide sign boards and barricades

IV. ENVIRONMENTAL ASSESSMENT FOR SUBPROJECTS AND/OR COMPONENTS

A. Environmental Safeguard Compliance Process for WBDWSIP Subprojects

57. All the projects need to go through the process of environmental assessment and obtain approvals/consents, etc., from the government regulatory agencies, to be eligible for funding under the project. The following charts show the process flow to ensure this compliance.



B. Environment Category of Subprojects

58. The scope of WBDWSIP includes provision of water supply infrastructure, from source to consumer. As part of the project preparation, environmental assessment for 4 sample subprojects in 3 project districts[9] was conducted and three IEEs with EMPs were prepared in accordance with requirements of EARF. The IEEs concluded that the project will have only small-scale, localized impacts on the environment which are readily mitigated. The potential adverse environmental impacts are mainly related to the construction period, which can be minimized by the mitigating measures and environmentally sound engineering and construction practices. Therefore, the project has been classified into environmental category B. The future subprojects will seek to replicate the sample subprojects and are thus expected to be category B due to the low-impact nature of such works.

[9] North 24 Parganas, Bankura and East Medinipur.

C. Subproject Selection Guidelines

1. Exclusion Criteria

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

Table 8: Exclusion Criteria

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

2. Environmental Guidelines for Project Selection

60. The following guidelines in Table 9, to be followed during the identification and finalization of subprojects, provide further guidance to avoid or minimize adverse impacts.

Table 9: Environment Guidelines for Project Selection

	Guidelines
1	Do not locate projects / components in eco sensitive areas (national parks, wildlife sanctuaries, tiger reserves, elephant reserves)
2	Facilities shall not be sited in locations with social conflicts
3	Avoid locations that will result in destruction/disturbance to historical and cultural places/values
4	Reflect inputs from public consultation for site selection
5	Project / component must comply with all requirements of relevant national and state laws
6	No project components shall be located within 300 m of Archaeological Survey of India (ASI) protected monuments/sites. In unavoidable circumstances, the works shall be limited to laying of water lines and provision of connections. Permission of ASI must be obtained prior to start of work.
7	Avoid location of projects / components in forest areas
8	Locate facility such that there is no disturbance/obstruction to natural drainage; no facilities shall be located in lakes, ponds, flood plains etc. Avoid all sites that may pose risk of flooding.
9	Avoid land acquisition and involuntary resettlement by • Using vacant government land where possible • Minimize the land acquisition by all possible measures in design, site or alignment changes etc., • Take all possible measures such as design with minimal land and selection of site or alignment to avoid resettlement impacts, etc.,

	Guidelines
1	Select sustainable water source – assess water availability and also abstraction should not lead to significant reduction in quantity and quality of overall water source
2	Augmentation of water supply from an existing groundwater source or development of new source should be supported by groundwater studies establishing water availability and sustainability, and also quality
3	Do not use water sources that may be polluted by upstream users; ensure adequate distance from upstream disposal point and the project intake (exact distance depend on the flow, disposal source, dilution capacity etc., but in no case an intake should located within 2 km downstream of any disposal point)
4	Avoid water-use conflicts by not abstracting water that is used for other purposes (e.g., irrigation)
5	As far as possible, Locate all new facilities/buildings at sites where there is no risk of flooding
6	As far as possible, locate pumping stations at least 50 m away from any premises used by people (house, shops)
7	As far as possible, locate pipelines within road right of way (ROW) as far as possible, to reduce the acquisition of new land.
8	Ensure sufficient access to water treatment plant, pumping stations, and reservoirs/tanks for operations and maintenance activities.
9	Do not use pipes that are manufactured from asbestos concrete; existing Asbestos Cement pipes, if any, should be left untouched in the ground
10	Ensure efficient water treatment process; avoid wastage of backwash water by recirculation
11	Ensure sludge management facilities are included in the water treatment plant.

D. Environmental Assessment Process for Subprojects

1. Screening and Categorization

61. As soon as sufficient information on a subproject is available, screening is to be conducted using the ADB's REA checklist (Appendix 10) to determine the subproject environmental category. Requirements as per the government regulations (clearances, approvals, consent etc.,) shall also be identified at this stage, including the requirement for environmental clearance as per the EIA Notification, 2006.

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

(i) **Category A.** The subproject is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, and may affect an area larger than the sites or facilities subject to physical works. This category of subprojects will not be implemented under WBDWSIP.

(ii) **Category B.** The subproject is likely to have less adverse environmental impacts than those classified as Category A. Such impacts are site-specific, mostly reversible, and, in most cases, it is possible to come up with mitigation measures more readily than in Category A projects. An IEE and an EMP are required for Category B projects.

(iii) **Category C.** The subproject is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications of the subproject need to be reviewed.

63. Under WBDWSIP no Category A projects will be implemented and therefore there is no requirement for conducting detailed EIA studies and preparation of EIA Reports.

2. Preparation of Environmental Assessment Report

64. **Initial Environmental Examination Study and Report**. For B category projects, an Initial Environmental Examination (IEE) report is required. IEE describes the studies conducted to identify the potential environmental impacts of a proposed development, and is prepared when

impacts are unlikely to be highly significant and can be mitigated relatively easily. While both the EIA and IEE fulfill the same purpose, EIA is a more detailed study and comprehensive document, because of greater severity of potential impacts.

65. WBDWSIP will improve infrastructure through the implementation of a series of subprojects, each providing improvements in water supply in particular area (one CD block or multiple CD blocks or as the case may be depending on the design of subproject). Each subproject will require one IEE Report.

66. Outline and content of an IEE Report is given in Appendix 11. The IEEs prepared during the PPTA for priority subprojects can be used as model documents for future subprojects.

67. Pollution prevention for conservation of resources, particularly technology for management of sludge, chlorine safety, occupational and community health and safety, shall be addressed in the IEEs. During the design, construction, and operation of the project, the executing agency shall apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS. The IEEs shall also reflect meaningful consultation and disclosure process with a provision for grievance redress mechanism.

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

69. 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, if the compensation is used to provide environmental benefits of the same nature and is commensurate with the project's residual impact.

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

71. In case subproject requires Environmental Clearance and EIA study as per the Government of India's EIA Notification, the environmental assessment documents prepared shall, to the extent possible, meet both EARF and Government of India requirements to streamline the environmental procedures required. It is to be noted that for EC, MOEFCC stipulated conduct of EIA study only by an accredited EIA Consultant as per the Government of India Norms.

3. Environmental Audit of Existing Facilities

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

4. Public Consultation, Information Disclosure and Grievance Redress

73. Public consultation and information disclosure is mandatory as part of the environmental assessment process for WBDWSIP projects. The adequacy of the public consultation and disclosure during the environmental assessment process will be one of the criteria used to determine the project compliance with ADB safeguard policies. Similarly, a grievance redress mechanism (GRM) to receive, evaluate, and facilitate the resolution of affected person's concerns, complaints, and grievances about the social and environmental performance at project level is to be established and detailed out in the IEE Report. GMR should be made operation during the EMP implementation phase.

74. The process of public consultation and information disclosure, which is to be carried through the project preparation and implementation, is presented in detailed the following Section V.

5. Review and Approval of Environmental Assessment Reports

75. IEE including EMPs, prepared/updated by consultants/contractors, will be reviewed and approved by Environmental and Social Safeguards Cell (ESSC) in the PMU. Approval of safeguard documents of respective subproject is pre-requisite to initiate the bidding process.

76. Borrower or the executing agency is primarily responsible for identifying, prioritizing, formulating, appraising, approving, and implementing subprojects in accordance with technical, financial, and economic appraisal criteria, including social and environmental criteria, mutually agreed upon between ADB and the borrower/executing agency. PMU will submit all IEEs to ADB for review and disclosure.

77. ADB will review and disclose on its website the final reports (IEEs) of all subprojects.

78. For subproject processing, the steps to be followed are shown in Table 10. It is the responsibility of the PHED and PMU to ensure subprojects are consistent with the legal framework, whether national, state, or local. Compliance is required in all stages of the project, including design, construction, and O&M.

Table 10: Environmental Procedures for Project Processing

Project Stage	Environmental Assessment and Review Framework Procedure	Government of India Procedure
Subproject identification Feasibility/ preliminary design	Rapid environmental assessment (REA) checklist	Categorization according to schedule and general/specific conditions in the government's Environmental Impact Assessment (EIA) Notification, 2006 (as amended till date)
	Categorization (A/B/C): project management unit (PMU) to review the REA checklists and reconfirm the categorization Preparation of initial environmental examinations (IEEs)	PMU to review the subproject proposals, and classify (A/B1/B2) as per the schedule. As of now None of the subprojects to be proposed under the West Bengal Drinking Water Sector improvement Project (WBDWSIP) are currently listed in the Schedule of EIA Notification 2006, and therefor EIS study and environmental clearance is not required. Liaise with the State Environmental Impact Assessment Authority (SEIAA)/Ministry of Environmental, Forest and Climate Change (MOEFCC) regularly for future policy changes in the EIA Notification and its applicability to the WBDWSIP. Identify other environmental related regulatory requirements based on the nature and location of the subproject (consent from West Bengal Pollution Control Board or WBPCB, clearance/approvals from Archaeological Survey of India or ASI, Forest Department etc.,)
Detailed design	Preparation of IEE Updating of IEEs based on detailed design	Submit application in the prescribed format to SEIAA for Category B and to MOEFCC for Category A projects, for issue of term of reference (TOR) for the EIA study. Prepare EIA Report as per the TOR and submit to SEIAA and MOEFCC For B2 projects, no EIA Report is required; appraisal and issue of environmental clearance will be based on the application form. Submit applications for other environmental related approvals to respective agencies (MPPCB, ASI etc.,)
	For projects involving facilities and/or business activities that already exist or are under construction, undertake an environment and/or social compliance audit, including on-site assessment, to identify past or present concerns related to impacts on the environment, and involuntary resettlement. Where non-compliance is identified, a corrective action plan shall be prepared, and agreed on by ADB and PHED, and implemented accordingly	Check the regulatory compliance of such facilities, in case of non-compliance, obtain clearances/approvals as required
	Public consultation will be carried out in a manner commensurate with the impacts of affected communities. The consultation process and its results are to be documented and reflected in the IEE.	Public (hearing) consultation and disclosure is required for A and B1 projects and consists of (i) a public hearing at or near the proposed site, and (ii) responses in writing from stakeholders.
	Disclosure: *For category B*: Disclosure on ADB's website	Disclosure is part the consultation. Regulatory agency discloses the Summary EIA report on their

Project Stage	Environmental Assessment and Review Framework Procedure	Government of India Procedure
	of the final IEE; updated IEEs and corrective action plans; and environmental monitoring reports. In addition, environmental information will be in an accessible place and in a form or language understandable to affected person and other stakeholders. For illiterate people, other suitable communication methods will be used.	website and invites responses from stakeholders. The Draft EIA report is made available on request until the public hearing.
	Mitigation measures specified in IEE study incorporated in project design	Mitigation measures specified in EIA/IEE study incorporated in project design
	Identify and incorporate environmental mitigation and monitoring measures (including the environmental management plan or EMP) into bid/contract documents	An EMP is required, identifying mitigation measures and specifying administrative arrangements to ensure that mitigation measures are implemented and their effectiveness is monitored after approval of the EIA. A budget for the EMP should also be provided
Appraisal	EMP and other environmental covenants are incorporated into the legal agreement, loan/project agreement, and project administration memorandum (PAM)	EIA Report is reviewed by an Expert Appraisal Committee (EAC), constituted by MOEFCC for Category A projects and SEIAA for B1 projects. Applications for other clearances/approvals will be apprised by respective agencies based on submissions and site reconnaissance
Approval	ADB will review draft final reports of all IEEs	Based on the EAC recommendation, MOEFCC/SEIAA will issue an environmental clearance, stipulating the conditions to be met during the implementation. Concerned agencies will issue clearances/approvals, stipulating conditions
Contract award	Confirm that all necessary environmental clearances, consents, and no-objection certificates (NOCs) as per the legal framework are in place prior to contract award. Implementation of EMP, including monitoring plans based on IEE findings to be incorporated into civil works contracts.	There is no regulatory condition on contract award, but as per the EIA Notification, environmental clearance is to be obtained before any construction work or land preparation (except land acquisition) may commence. All other clearances are also to be obtained before the start of work including land clearance.
Implementation	Submission of semi-annual monitoring report to ADB, including corrective action plan where non-compliance is identified	Project proponent to submit half-yearly compliance reports in respect of the stipulated environmental clearance conditions. MOEFCC/SEIAA will initiate necessary action in case of non-compliance.

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

V. CONSULTATION, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM

A. Public Consultation

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

processing, and implementation. Meaningful stakeholder consultation and participation is part of the project preparation and implementation strategy.

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

(i) project beneficiaries, and project affected persons
(ii) elected representatives, community leaders, and representatives of community-based organizations; business and industrial associations, etc.,
(iii) relevant local NGOs;
(iv) local government and relevant government agencies, including the authorities responsible for land acquisition, protection and conservation of forests and environment, archaeological sites, religious sites, and other relevant government departments (regulatory, administration and infrastructure services related)
(v) residents, shopkeepers, business people, farmers, fisheries (owners and workers) who live and work alongside the roads where pipes will be laid and near sites where facilities will be built; custodians, and users of socially and culturally important buildings;
(vi) Vulnerable groups, women groups etc.

81. A variety of approaches can be adopted, and stakeholders should be consulted throughout the project implementation. At minimum the following consultation activities (Table 11) should be conducted. This is indicative and project agencies can also adopt more effective methods and approaches, which are locally appropriate. Consultations shall be conducted in an atmosphere which is conducive to the development of the subprojects and beneficial to the affected persons and other stakeholders. The implementing agency will ensure that the consultations are free of coercion and intimidation, gender-inclusive, and tailored to the needs of disadvantaged and vulnerable groups.

Table 11: Proposed Public Consultation Activities

Project Stage	Consultation Activities	Remarks
Subproject preparation	Household level consultations through sample questionnaire surveys on service levels, needs, priorities for project preparation	At the start of the project
	Focus group discussions with people residing/working near the project sites	During the visits to project sites
	A subproject level consultation workshop with all key stakeholders (CD block-wise or district-wise, as appropriate)	Once the draft initial environmental examination (IEE) report is prepared
	Consultations with Affected persons: Affected persons shall be consulted to ensure: • incorporate their views/concerns on compensation/resettlement assistance • inclusion of vulnerable groups in project benefits; • identify assistance required by affected persons during rehabilitation, if any; and • Avoid potential conflicts for smooth project implementation. It will also provide adequate opportunities for consultation and participation to all stakeholders and inclusion of the poor, vulnerable, marginalized, and affected persons in the project process	At various stages, especially during, the preparation and implementation of resettlement plan
Subproject Implementation	Focus group discussions with the people residing/working near the project sites	During the environmental management plan (EMP) monitoring at work sites

Project Stage	Consultation Activities	Remarks
	Informal discussions with the construction workers and construction supervision staff (contractor, consultants and project implementation unit or PIU)	During the EMP monitoring at work sites
	Informal discussions with commuters and general public along the roads where works are implemented	During the EMP monitoring at work sites

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

83. Outline for preparation of minutes of stakeholder consultation meetings is given at Appendix 13.

B. Information Disclosure

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

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

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

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

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

(i) For category B projects:[10]

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

a. final IEE;
b. a new or updated IEE and corrective action plan prepared during project implementation, if any; and
c. environmental monitoring reports.

C. Grievance Redress Mechanism

88. A common grievance redress mechanism (GRM) will be in place to redress social, environmental or any other project and/or subproject related grievances. The GRM described below has been developed in consultation with stakeholders. Public awareness campaign will be conducted to ensure that awareness on the project and its grievance redress procedures is generated. The campaign will ensure that the poor, vulnerable and others are made aware of grievance redress procedures and entitlements per project entitlement matrix, and PMU and concerned PIUs will ensure that their grievances are addressed.

89. Affected persons will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaints/suggestion boxes or through telephone hotlines at accessible locations, by e-mail, by post, or by writing in a complaints register in Gram Panchayat office or PMU or PIU office. Careful documentation of the name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved will be undertaken. PMU Head, Safeguards and Gender Officer (HSGO) together with PIU Safeguard Officers will have the joint responsibility for timely grievance redressal on safeguards and gender issues and for registration of grievances, related disclosure, and communication with the aggrieved party. The affected persons will also be encouraged to seek a complaint registration number through the PIU.

90. The grievance redress mechanism provides an accessible, inclusive, gender-sensitive and culturally appropriate platform for receiving and facilitating resolution of affected persons' grievances related to the project. A two-tier grievance redress mechanism is conceived, one, at project level and another, beyond project level. For the project level GRM, a Grievance Redress Cell will be established at PIU; the safeguards officers of the ESSU PIU, supported by the social safeguards specialist of DSICS will be responsible for conducting periodic community meetings with affected communities to understand their concerns and help them through the process of grievance redressal including translating the complaints into Bengali or English, recording and registering grievances of non-literate affected persons and explaining the process of grievance redress mechanism. All expedient and minor grievances will be resolved at field level; should the PIU fail to resolve any grievance within the stipulated time period, the PMU will be consulted and suggested actions by PMU taken by PIU with SPISC support, within specified time. PIU will also be responsible for follow-through for each grievance, periodic information dissemination to complainants on the status of their grievance and recording their feedback (satisfaction/dissatisfaction and suggestions). In the event that certain grievances cannot be resolved at project level, they will be referred to the District Steering Committee (DSC), which will also act as grievance redress committee (GRC), particularly in matters related to land purchase/acquisition, payment of compensation, environmental pollution etc. Any higher than district level inter-departmental coordination or grievance redress required will be referred to the state level Steering Committee.

91. The GRM aims to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project. All grievances – major or minor, will be registered. In case of grievances that are immediate and urgent in the perception of the complainant, the contractor, and supervision personnel from the PIU supported by DSISC will try

to successfully resolve them in consultation with the Member, Panchayat and the Gram Panchayat Pradhan. In case of larger issues, they will seek the advice and assistance of the Superintending Engineer PIU. Grievances not redressed through this process within/at the project level within stipulated time period will be referred to the DSC/GRC.

92. The DSC will be set up to monitor project implementation in each district. In its role as a GRC, the DSC will meet every month (if there are pending, registered grievances), determine the merit of each grievance, and resolve grievances within specified time upon receiving the complaint-failing which the grievance will be addressed by the state-level steering committee. The steering committee will resolve escalated/unresolved grievances received. Grievances remaining unresolved by steering committee may be referred by affected persons to appropriate courts of law. The multi-tier GRM for the project is outlined below (Figure 2), each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required. The GRC will continue to function throughout the project duration. The PMU shall issue notifications to concerned PHE Divisions to establish the respective PIU (and field) level GRCs, with details of composition, process of grievance redress to be followed, and time limit for grievance redress at each level.

93. An aggrieved person shall have access to the country's legal system at any stage, and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

94. **Composition of Grievance Redress Committee and PSC**. The DSC, acting as GRC will have District Magistrate (Chairperson), Superintending Engineer, PIU as Member Secretary, Additional Executive Officer, Zilla Parishad, Assistant (Social and Environmental) Safeguard Officers of the Environment and Social Safeguard Units (ESSU) of the PIU, Institutional Support and Capacity Building Officer, PIU, Block Development Officers from respective blocks, and representatives from the affected village panchayat and / or community, if any, eminent citizens, CBOs and NGOs. The DSC/GRC must have a minimum of two women members. In case of any indigenous people impacts in future subprojects, the DSC/GRC must have representation of the affected indigenous people community, including at least one female indigenous person, 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 indigenous people groups.

95. The Steering Committee will include Chief Secretary, as chair, Principal Secretary/Additional Chief Secretary, PHED, Principal Secretary, Panchayat and Rural Development, Principal Secretary, Finance, Principal Secretary, Irrigation and Waterways Development Department, Principal Secretary, Public Works Department, Engineering in Chief, PHED, Member Secretary, and Others as invitees.

96. **Areas of Jurisdiction.** The areas of jurisdiction of the GRC, headed by the District Magistrate will be (i) all locations or sites within the district where subproject facilities are proposed, or (ii) their areas of influence within the District. The SC will have jurisdictional authority across the state (i.e., areas of influence of subproject facilities beyond district boundaries, if any).

97. **Recordkeeping**. Records 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 will be kept by PIU (with the support of DSISC) and submitted to PMU.

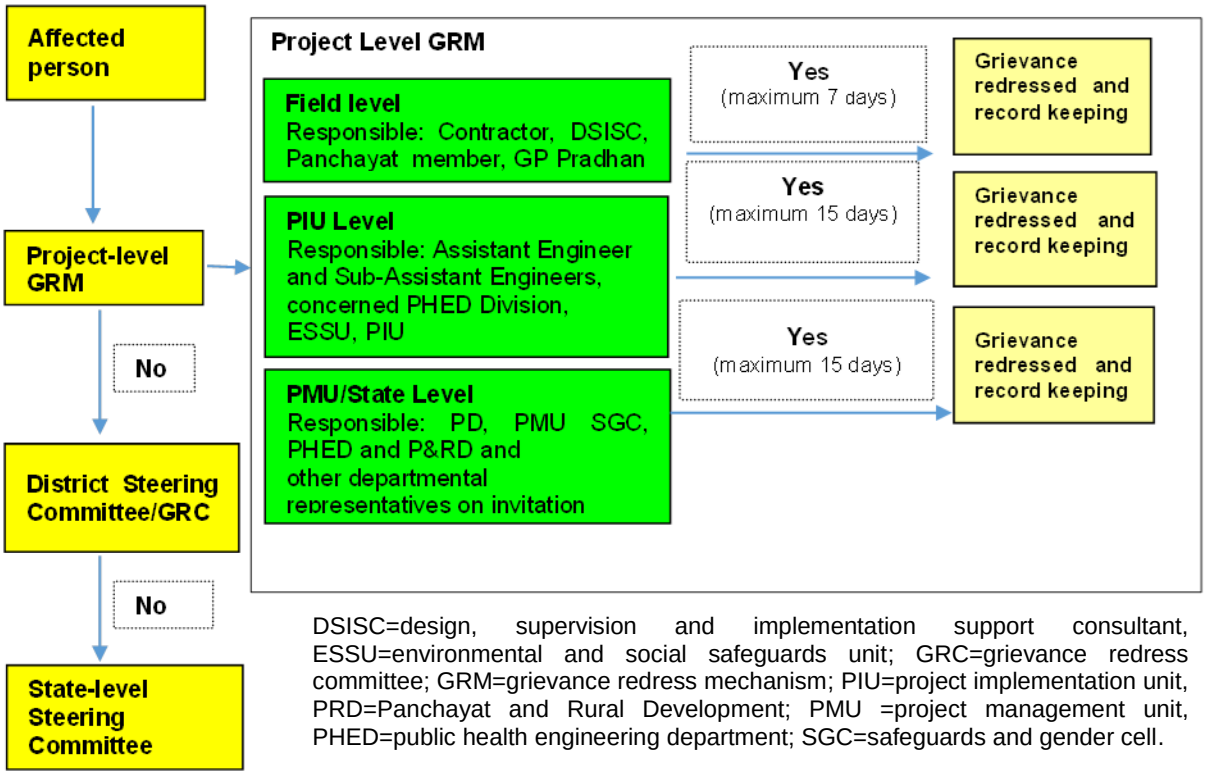
98. **Information Dissemination Methods of the Grievance Redress Mechanism**. The PIU, assisted by SPISC will be responsible for information dissemination to affected persons on grievance redressal procedure. Gram Panchayat/coverage area/affected area-wide public awareness campaigns will ensure that awareness on grievance redress procedures is generated through the consultation and participation plan. Public awareness campaign will be conducted to ensure that awareness on the project and its grievance redress procedures is generated. The PIU assistant safeguard officers (environment and social) will be assisted by DSISC safeguards specialists with information/collateral/awareness material etc. and in conducting project awareness campaigns. The campaign will ensure that the poor, vulnerable and others are made aware of grievance redress procedures and entitlements per agreed entitlement matrix including. 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. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PMU and PIU offices, Gram Panchayat/concerned local panchayat notice boards and on the web, as well as reported in the semi-annual environmental and social monitoring reports to be submitted to ADB. A sample grievance registration form has been attached in Appendix 12.

99. **Periodic review and documentation of lessons learned.** The PMU ESC will periodically review the functioning of the GRM and record information on the effectiveness of the mechanism, especially on the PIU's ability to prevent and address grievances.

100. **Costs.** All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the PMU. Cost estimates for grievance redress are included in resettlement cost estimates. The grievance redress process is shown in Figure 2.

101. **ADB's Accountability Mechanism.** In the event that the established GRM is not in a position to resolve the issue, the affected person also can use the ADB Accountability Mechanism through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB India Resident Mission. The complaint can be submitted in any of the official languages of ADB's developing member countries. Before submitting a complaint to the Accountability Mechanism, it is recommended that affected people make a good faith effort to resolve their problems by working with the concerned ADB operations department (in this case, the resident mission). Only after doing that, and if they are still dissatisfied, they could approach the Accountability Mechanism. The ADB Accountability Mechanism information will be included in the project-relevant information to be distributed to the affected communities, as part of the project GRM.

Figure 2: Grievance Redress Mechanism



DSISC=design, supervision and implementation support consultant, ESSU=environmental and social safeguards unit; GRC=grievance redress committee; GRM=grievance redress mechanism; PIU=project implementation unit, PRD=Panchayat and Rural Development; PMU =project management unit, PHED=public health engineering department; SGC=safeguards and gender cell.

VI. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

A. Implementation Arrangements

102. Public Health Engineering Department (PHED) of Government of West Bengal will be the executing and implementing agency of the WBDWSIP, responsible for management, coordination and execution of all activities funded under the loan. A project management unit (PMU), exclusively established in PHED, will assist the PHED in implementation of WBDWSIP. PMU will be supported by district level Project Implementation Units (PIUs). PMU will be headed by a Project Director in the rank of Chief Engineer. Each PIU will be headed by a Superintending Engineer, reporting to the Project Director. PMU with the support of PIUs will be responsible for planning, implementation, monitoring and supervision, and coordination of all activities under the WBDWSIP. A PIU for North 24 Parganas district has already been established, and process is on for establishing PIUs in Bankura and East Medinipur.

103. PMU will be supported by Project Management Consultant (PMC) to supervise, monitor and oversee the implementation. Each PIU will be supported by a Design, Supervision and Institutional Support Consultant (DSISC); there will be three DSISCs supporting 3 PIUs respectively in North 24 Parganas, Bankura and East Medinipur districts. PIUs will appoint construction contractors to build infrastructure.

104. A Steering Committee, headed by Chief Secretary, will provide strategic guidance, and oversee the implementation of the investment project. District Steering Committee, headed by the respective District Magistrate, will be established to monitoring program implementation at districts level.

B. Safeguard Implementation Arrangement

105. **Project Management Unit.** A Safeguard and Gender Cell (SGC) will be established in PMU with the overall responsibility of ensuring compliance with ADB SPS. SGC will be headed by a HSGO and will report to the Project Director directly. The HSGO will have overall responsibility in implementation of the RF, EARF, RPs, EMPs, SEMP, GESI action plan, and appropriate monitoring and reporting responsibilities. Key environmental safeguard tasks and responsibilities at the PMU level are as follows:

(i) Ensure subprojects confirms to exclusion criteria and project selection guidelines as stipulated in the EARF;
(ii) Approve subproject environmental category;
(iii) Approve IEEs; ensure that updated IEEs/EMPs reflect final project designs;
(iv) Ensure that EMPs are included in bidding documents and civil works contracts;
(v) Ensure proper implementation of EMPs by contractors;
(vi) Facilitate and ensure compliance with all government rules and regulations regarding site and environmental clearances, as well as any other environmental requirements (e.g. location clearance certificates, environmental clearance certificates), as relevant;
(vii) Oversee public consultation and disclosure;
(viii) Approve quarterly EMP implementation reports;
(ix) Review and approve semi-annual monitoring reports prepared by PMC; and submit to ADB;
(x) Oversee grievances redress process and ensure timely redress;
(xi) Undertake regular review of safeguards related loan covenants, and the compliance in program implementation; and
(xii) Organize periodic capacity building and training programs for WBDWSIP stakeholders, PHED, PMU and PIU staff on safeguards.

106. The SGC will be supported by environmental, social and gender safeguard specialists in the PMC. Key safeguard tasks and responsibilities of Environmental Management Specialist of the PMC on environmental safeguards are as follows:

(i) Review and finalize REA checklist and classify the project;
(ii) Review and confirm project selection/ design; ensure compliance with exclusion criteria and project environmental selection guidelines;
(iii) Review and finalize IEE reports including EMPs prepared/updated by PIUs/DSISCs;
(iv) Oversee public consultation and information disclosure activities; ensure timely disclosure;
(v) Provide advise/support in obtaining government clearance/ approvals;
(vi) Review and confirm that IEEs/EMPs are included in bids and contracts;
(vii) Review and confirm SEMPs prepared by contractor;
(viii) Oversee the implementation of SEMP by contractors and ensure corrective actions, where necessary;
(ix) Review and approve quarterly environmental monitoring reports submitted by PIU/DSISCs;
(x) Conduct site visits of project facilities and work sites to oversee implementation;
(xi) Prepare semi-annual environmental monitoring reports and submit to PMU SGC HSGO;

(xii) Oversee grievance redress process; advise on critical grievance related to environmental issues and concerns; and
(xiii) Organize training and capacity development programs.

107. **Project Implementation Unit.** At each PIU, an Assistant Engineer will be given additional responsibilities of safeguard tasks and will be designated as Assistant Safeguards Officer. The Safeguards Officer will oversee the safeguards implementation at PIU level, coordinate public consultations, information disclosure, regulatory clearances and approvals, RP implementation, EMP implementation and grievance redressal. Key environmental safeguard tasks and responsibilities of Safeguards Officer are as follows:

(i) Coordinate public consultation and information disclosure;
(ii) Liaise with local offices of regulatory agencies in obtaining clearances /approvals; assist PMU for clearances obtained at state level;
(iii) Review and approve contractors SEMPs;
(iv) Oversee day-to-day implementation of SEMPs by contractors, including compliance with all government rules and regulations;
(v) Take necessary action for obtaining rights of way;
(vi) Ensure continuous public consultation and awareness;
(vii) Coordinate grievance redress process and ensure timely actions by all parties;
(viii) Review monthly contractor's SEMP Monitoring Reports;
(ix) Review and forward quarterly monitoring reports to PMU; and
(x) Inform PMU of unanticipated impacts and formulate corrective action plan; and
(xi) Recommend issuance of work construction work completion certification to the contractor upon verification of satisfactory post-construction clean-up.

108. The PIUs will be assisted by DSISC teams which will include an Environmental Specialist and a Social Safeguards Specialist. Following are the key tasks of Environmental Specialist of DSISC:

(i) Assist PIU in identifying projects/components in compliance with the project exclusion criteria and selection guidelines stipulated in EARF;
(ii) Prepare environmental screening checklists and submit to PMU for categorization; update checklist and category as and when required to reflect project changes, and report to PMU;
(iii) Work closely with PIU and design teams to include environmental considerations in project location, design and technical specifications;
(iv) Identify statutory clearance / permissions / approvals required for subproject; assist PIU in obtaining them;
(v) Assist in including standards/conditions, if any, stipulated in regulatory clearances, consents in the project design;
(vi) Update IEE and EMP to reflect any changes in subproject during detail design / implementation; IEE shall reflect the final project design;
(vii) Lead / assist PIU in public consultation in compliance with the EARF; reflect inputs from public consultation in IEEs, EMPs, and project design;
(viii) Advise / assist PIU in disclosing relevant information on safeguards to stakeholders, affected people etc.;
(ix) Assist / ensure all EMP measures related project design and location and included in the detailed designs;
(x) Integrate EMP into the bid and contract documents (for DBO contracts, include full IEE including EMP in bids);

(xi) Advise contractor in preparation of SEMP as per the final design, prior to start of construction;
(xii) Ensure that all necessary clearances/permission (including those required by Contractor) are in place prior to start of construction;
(xiii) Monitor implementation of SEMP;
(xiv) ensure Contractors including subcontractor's, if any, comply with the measures set forth in the EMP;
(xv) Assist PIU in establishing GRM for the Project:
(xvi) Assist PIU in grievance redress, advise the contractor on appropriate actions on grievances, ensure timely resolution and proper documentation;
(xvii) Identify, if any, non-compliance or unanticipated impacts; initiate corrective actions, report to PMU;
(xviii) Review and approve monthly monitoring reports submitted by Contractor; consolidate and prepare quarterly Environmental Monitoring Reports (EMR) and submit to PMU; and
(xix) Conduct training and capacity building activities (workshops, hands-on trainings, visits etc.,) in EMP implementation.

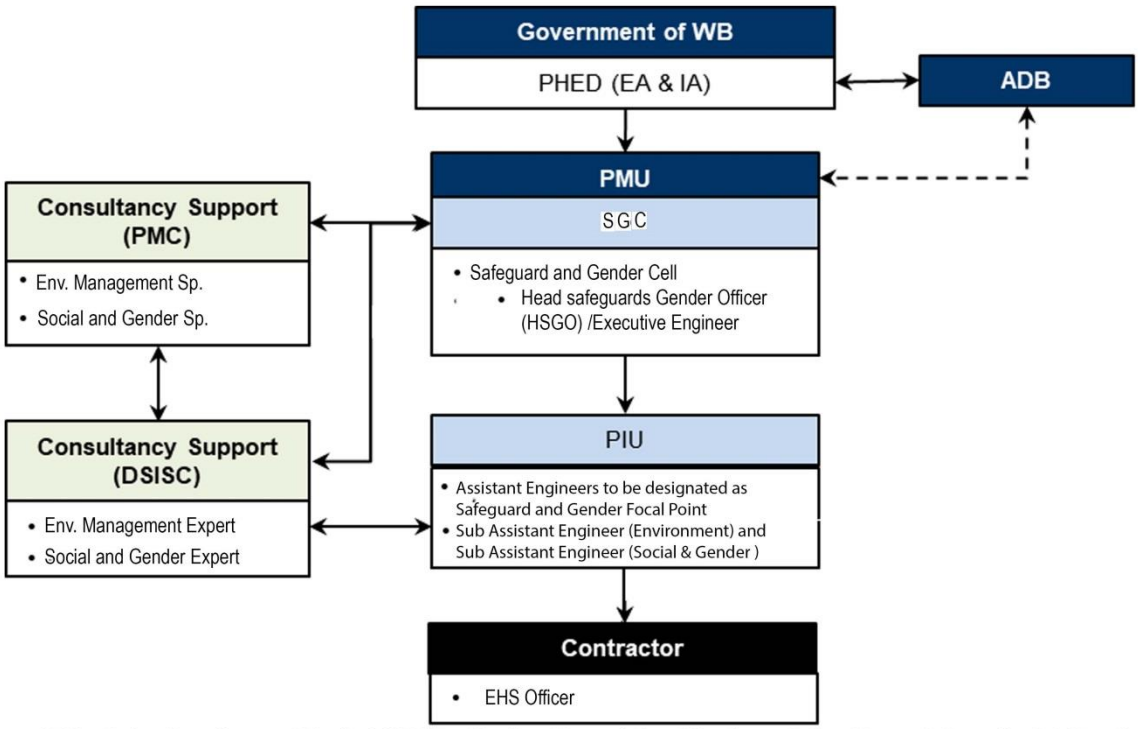
109. **Civil Works Contracts and Contractors.** IEEs are to be included in bidding and contract documents. The PMU and PIUs will ensure that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; and (c) elimination of forced labor; and with (ii) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites. The contractor will be required to appoint an Environment, Health and Safety (EHS) supervisor to implement EMP. The EHS Supervisor will update the EMP and submit an SEMP for approval of PIU. Contractors will carry out all environmental mitigation and monitoring measures outlined in EMP, approved SEMP and their contracts. Key responsibilities of the EHS supervisor are:

(i) Prepare SEMP and submit to PIU for approval prior to start of construction;
(ii) Conduct orientation and daily briefing sessions to workers on environment, health and safety;
(iii) Ensure that appropriate worker facilities are provided at the work place and labor camps as per the contractual provisions;
(iv) Records accidents and undertake remedial actions;
(v) Implement SEMP measures and report to PIU/DSISC if any new impacts are surfaced; seek guidance from as required in EMP implementation;
(vi) Conduct environmental monitoring (air, noise etc.,) as per the monitoring plan
(vii) Ensure conduct of water quality surveillance program;
(viii) Prepare monthly EMP monitoring reports and submit to PIU;
(ix) Work closely with PIU Safeguards Officer and consultants to ensure communities are aware of project-related impacts, mitigation measures and GRM; and
(x) Address any public compliance and grievances effectively and in timely manner.

110. The PMU will ensure that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; and (c) elimination of forced labor; and with (ii) the requirement to disseminate information on

sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites.

Figure 3: Safeguard Implementation Arrangements



ADB – Asian Development Bank; DSISC – Design, Supervision & Implementation Support Consultant; EA – Executing Agency; EHS – Environment, Health & Safety; ESSC – Environment & Social Safeguards Cell; GoWB – Government of West Bengal; IA – Implementing Agency; PHED – Public Health Engineering Department; PIU – Project Implementation Unit; PMU - Project Management Unit; PMC – Project Management Consultant

Table 12: Project Safeguard Activities, Reference Documents and Responsibility

Activity	Reference in Environmental Assessment and Review Framework	Responsibility
Preliminary Design and Detailed Design		
Refer to subproject selection guidelines - Include design and location considerations to avoid potential environmental impacts	**Section V C 1 and 2** **Table 8:** Exclusion Criteria **Table 9:** Environment Guidelines for Project Selection	Project management unit (PMU) / project management consultant (PMC)
Conduct categorization	Appendix 10: Rapid Environmental Assessment (REA) Checklist	PMU / PMC
Conduct environmental assessment and prepare initial environmental examination (IEE) Report	Appendix 11: Outline of IEE Report	
Formulate mitigation measures for potential environmental impacts which cannot be avoided thru design and change of location/s	Appendixes 14, 15 and 16: Suggested Mitigation Measures for Potential Environmental Impacts	PMU / PMC

Activity	Reference in Environmental Assessment and Review Framework	Responsibility
Conduct meaningful consultations with stakeholders and affected person	Appendix 13: Outline of Minutes of Consultation Meeting; Suggested Topics to be Discussed, Record-Keeping, Attendance Sheet	PMU / PMC
File application for required environmental consents/permits and Include measures to comply with conditions of consents and permits	• Consent to Establish from State Pollution Control Board (online application http://emis.wbpcb.gov.in). • Permission from KoPT for intakes and works on the bed or bank of Hooghly River • Tree-cutting Permit • Etc., Appendix 17: Tree Cutting Application From Appendix 5: KoPT Procedure and Application Form	- PMC to assist Project implementation unit (PIU) in preparation of application and supporting documents - PIU to request local body to sign applications
Bid process		
Bid evaluation	Assist in Bid Evaluation to ensure contractor shall (a) comply with the mitigation measures set forth in the environmental management plan (EMP) and any corrective or preventative actions set forth in a EMR that the PMU and PIU will prepare from time to time to monitor implementation, (b) make available a budget for all environmental measures, (c) provide PIU with a written notice of any unanticipated environmental impacts that arise during construction, implementation or operation of the subproject that were not considered in the EMP	PMC
Establish grievance redress mechanism (GRM) and ensure members of the GRM committees have capacity to address project-related issues/complaints	Section VI C: Grievance Redress Mechanism	PIU and local body
Construction		
Submit site-specific EMP, health and safety plan, traffic management plan and list of areas for work camps, storage and disposal areas to PIU prior to start of construction	Refer to respective IEE and EMP Reports	
Implement site-specific EMP	-	
Strictly comply with health and safety plan	-	
Coordinate with local body for implementation of traffic management plan	-	
Submit environmental monitoring reports	Appendix 19: Sample Construction Site Checklist for EMP Monitoring Appendix 20: Semi-annual Environmental Monitoring Report Template	
Operation		
Prior to commissioning, file application for required environmental consents/permits	For Consent to operate water treatment plant (WTP)	

C. Institutional Capacity and Development

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

112. PMU HSGO and PIU Safeguards Officers will be trained by PMC and DSISC's safeguards experts on safeguards issues related to the project, GESI action plan and GRM. The EARF, RF, IPPF and GESI action plan provided indicative capacity building program which included modules on: (i) introduction and sensitization to ADB SPS on environmental, involuntary resettlement and indigenous people policies and requirements; (ii) project related requirements as provided in the EARF, RF, IPPF and GESI action plan, (iii) review, updating and preparation of the IEEs, SEMPs, RPs, DDRs and IPPs (as required) upon the completion of project detailed design; (iii) improved coordination within nodal departments; (iv) monitoring and reporting system; and (v) project GRM. Briefings on safeguards principles, GRM and GESI action plan will also be conducted to the contractors upon their mobilization by PIU Safeguards Officers supported by DSISCs. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. An outline training program is presented in Table 13.

Table 13: Training Program for Environmental Management

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

Description	Contents	Schedule	Participants
		PMU, PIUs, and PMC (at Kolkata)	

DSISC = design, supervision and institutional support consultant, EARF = environmental assessment and review framework, EMP = environmental management plan, PIU = project implementation unit, PMC = project management consultant, PMU = project management unit, WBDWSIP = West Bengal Drinking Water Sector Improvement Project.

D. Staffing and Budget

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

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

114. For budgeting purposes, it is assumed that all new subprojects will be classified by ADB as category B (requiring IEE).

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

(i) DSISC will conduct environmental assessment and prepare IEEs;
(ii) PMC will review, finalize and submits the documents to PMU, who will approve the IEEs and further submits to ADB;
(iii) Public consultation and disclosure will be conducted by respective PIUs with the assistance of DSISCs.

116. The infrastructure will take about 2-3 years to build. Environmental monitoring during construction will also be straightforward, and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by DSISC, monitored by PMC. PMU and PIU safeguards officers will oversee these activities.

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

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

119. The indicative costs of EARF implementation are shown in Table 14. An implementation period of 72 months is considered for the preparing following costs. Three PIUs and same number of DSISCs are considered. It is assumed that each PIU will implement 3 subprojects on an average.

Table 14: Indicative Cost of Environmental Assessment and Review Framework Implementation

Component	Description	Input	Cost Per Unit (₹)	Total Costs (₹)	Source of Funds
A. Full Time Staff					
PMU	Safeguards Officer	Full time	-	-	PHED staff
	Assistant Safeguards Officer	Full time	-	-	PHED staff
At each PIU	Assistant Safeguards Officer	Additional charge to Assistant Engineer	NA	NA	PHED staff
B. Consultants / staff					
PMC	Environmental Management Specialist	1 x 21 months	300,000 per month	6,300,000	Consultant costs of project
In each DSISC	Environmental Specialist	3 x 26 months	250,000 per month	19,500,000	As above
	Support environmental engineer	3 x 48 months	50,000 per month	7,200,000	
With each contractor	EHS supervisor	9 x 24 months	30,000 per month	6,480,000	Contractor's cost (included in project cost)
Sub-Total			₹	**39,480,000**	
			USD ($)		
C. Regulatory, Consultation and Monitoring Costs					
Legislation, permits, and agreements, implementation of measures etc.,	Consent fee for WTPs, forest permission etc.	Lump sum	300,000 per subproject	3,600,000	Included in the overall project cost
Environmental monitoring	During construction	Lump sum	300,000 per subproject	3,600,000	Contractor's cost (included in project cost)
Public consultations and information disclosure	Consultation meetings, disclosure	Lump sum	100,000 per subproject	1,200,000	PIU costs – part of incremental administration
Capacity development in environmental safeguards	Awareness and training programs - venue and other arrangements	Training workshops to all program agencies	Lump sum	500,000	PMU costs - part of incremental administration
Sub-Total			₹	**8,900,000**	
			USD ($)		

DSISC = design, supervision and institutional support consultant, EHS = environmental, health and safety, ₹ = Indian rupee, PHED = Public Health Engineering Department, PIU = project implementation unit, PMC = project management consultant, $ = United States Dollar, WTP = water treatment plant.

VII. MONITORING AND REPORTING

120. Monitoring and reporting on overall EARF compliance, subproject selection guidelines and exclusion criteria and on implementation of subproject-wise EMPs are the key tasks in safeguard implementation in WBDWSIP. Through the PMU, PHED will monitor and measure the progress

of EMP implementation. The monitoring activities will correspond with the subproject's risks and impacts. PMU and PIUs, with the assistance of PMC and DSISC will undertake site inspections and document review to verify compliance with the EMP.

121. Contractor will submit monthly implementation reports to PIU. PIU/DSISC will consolidate and prepare a quarterly report on implementation and monitoring to PMU, who will take follow-up actions, if necessary. Based on the monthly, quarterly and supplemented by periodic monitoring and review visits, PMC will prepare semi-annual environmental monitoring reports (SEMR) and submit to PMU, which will review and approve and submit to ADB. The suggested monitoring report format is in Appendix 20. Subproject budgets will reflect the costs of monitoring and reporting requirements. For projects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis. Monitoring reports will be posted in a location accessible to the public. Supplied water quality will be monitored to ensure that the water quality is within the acceptable guidelines. Surveillance monitoring for water sources is also proposed in the EMP. Besides EMP monitoring plan, the contractor's scope includes preparation and implementation of a water quality surveillance program including development of a water quality laboratory.

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

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

123. ADB's monitoring and supervision activities are carried out on an on-going basis until a Project Completion Report (PCR) is issued. ADB issues a PCR within 1-2 years after the project is physically completed and in operation.

ENVIRONMENTAL STANDARDS

Table A1. General Standards for Discharge of Environmental Pollutants (Wastewater)

	Parameter	Inland Surface Water	Public Sewers	Land for Irrigation
	2		3	.
.	.	(a)	(b)	(c)
1	Suspended solids mg/l, max.	100	600	200
2	Particle size of suspended solids	shall pass 850 micron IS Sieve	-	-
3	pH value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
4	Temperature	shall not exceed 5oC above the receiving water temperature		
5	Oil and grease, mg/l max,	10	20	10
6	Total residual chlorine, mg/l max	1.0	-	-
7	Ammonical nitrogen (as N), mg/l, max.	50	50	-
8	Total kjeldahl nitrogen (as N); mg/l, max. mg/l, max.	100	-	-
9	Free ammonia (as NH3), mg/l,max.	5.0	-	-
10	Biochemical oxygen demand (3 days at 27oC), mg/l, max.	30	350	100
11	Chemical oxygen demand, mg/l, max.	250	-	-
12	Arsenic(as As).	0.2	0.2	0.2
13	Mercury (As Hg), mg/l, max.	0.01	0.01	-
14	Lead (as Pb) mg/l, max	0.1	1.0	-
15	Cadmium (as Cd) mg/l, max	2.0	1.0	-
16	Hexavalent chromium (as Cr + 6), mg/l, max.	0.1	2.0	-
17	Total chromium (as Cr) mg/l, max.	2.0	2.0	-
18	Copper (as Cu) mg/l, max.	3.0	3.0	-
19	Zinc (as Zn) mg/l, max.	5.0	15	-
20	Selenium (as Se)	0.05	0.05	-
21	Nickel (as Ni) mg/l, max.	3.0	3.0	-
22	Cyanide (as CN) mg/l, max.	0.2	2.0	0.2
23	Fluoride (as F) mg/l, max.	2.0	15	-
24	Dissolved phosphates (as P),mg/l, max.	5.0	-	-
25	Sulphide (as S) mg/l, max.	2.0	-	-
26	Phenolic compounds (as C6H50H) mg/l, max.	1.0	5.0	-
27	Radioactive materials: (a) Alpha emitters micro curie mg/l, max. (b)Beta emitters micro curie mg/l	10^{-7} 10^{-6}	10^{-7} 10^{-6}	10^{-8} 10^{-7}
28	Bio-assay test	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent
29	Manganese	2 mg/l	2 mg/l	-
30	Iron (as Fe)	3mg/l	3mg/l	-
31	Vanadium (as V)	0.2mg/l	0.2mg/l	-
32	Nitrate Nitrogen	10 mg/l	-	-

Standards for Composting

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

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

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

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

National Ambient Air Quality Standards

S. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential, Rural and Other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1	Sulphur Dioxide (SO_2), µg/m³	Annual*	50	20	- Improved West and Gaeke
		24 hours**	80	80	-Ultraviolet fluorescence
2	Nitrogen Dioxide (NO_2), µg/m³	Annual*	40	30	- Modified Jacob & Hochheiser (Na-Arsenite)
		24 hours**	80	80	- Chemiluminescence
3	Particulate Matter (size less than 10µm) or PM_{10} µg/m³	Annual*	60	60	- Gravimetric - TOEM
		24 hours**	100	100	- Beta attenuation
4	Particulate Matter (size less than 2.5µm) or $PM_{2.5}$ µg/m³	Annual*	40	40	- Gravimetric - TOEM
		24 hours**	60	60	- Beta attenuation
5	Ozone (O_3) µg/m³	8 hours**	100	100	- UV photometric - Chemilminescence
		1 hour**	180	180	- Chemical Method
6	Lead (Pb) µg/m³	Annual*	0.50	0.50	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
		24 hours**	1.0	1.0	
7	Carbon Monoxide (CO) mg/m³	8 hours**	02	02	- Non Dispersive Infra Red (NDIR) spectroscopy
		1 hour**	04	04	
8	Ammonia (NH_3) µg/m³	Annual*	100	100	-Chemiluminescence
		24 hours**	400	400	-Indophenol blue method
9	Benzene (C_6H_6) µg/m³	Annual*	05	05	- Gas chromatography based continuous analyzer - Adsorption and Desorption followed by GC analysis
10	Benzo(a)Pyrene (BaP) - particulate phase only, ng/m³	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/m³	Annual*	06	06	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m³	Annual*	20	20	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper

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

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

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

Ambient Noise Standards

Area Code	Category of Area / Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note:- 1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A "decibel" is a unit in which noise is measured.

"A", in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level over a specified period.

Surface Water Quality Classification Criteria

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

Source: Central Pollution Control Board.
MPN = Most Probable Number.

Vehicle Exhaust Emission Norms

1. Passenger Cars

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

2. Heavy Diesel Vehicles

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

CO = Carbon Monoxide; g/kmh = grams per kilometer-hour; HC = Hydrocarbons; NOx = oxides of nitrogen; PM = Particulates Matter.
Source: Central Pollution Control Board.

DRINKING WATER STANDARDS

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

14.	Manganese (mg/L, Mn) Max	0.1	Beyond this limit taste/appearance are affected, has advers effect on domestic use and water supply structure	0.3	-
15.	Sulphate (mg/L, SO4) Max.	200	Beyond this causes gastro intestinal irritation when magnesium or sodium are present	400	May be extended upto 400 provided magnesium (as Mg) does not exceed 30
16.	Nitrate (mg/L, NO3) Max.	45	Beyond this methaemoglobinemia takes place.	100	-
17.	Fluoride (mg/L, F) Max.	1.0	Fluoride may be kept as low as possible. High fluoride may cause fluorosis.	1.5	-
18.	Phenolic Compounds (mg/L C6H5OH) Max.	0.001	Beyond this, it may cause objectionable taste and odour	0.002	-
19.	Mercury (mg/L Hg) Max	0.001	Beyond this the water becomes toxic	No Relaxation.	To be tested when pollution is suspected
20	Cadmium (mg/L, Cd) Max	0.01	Beyond this the water becomes toxic	No Relaxation.	To be tested when pollution is suspected
21.	Selenium (mg/L, Se) Max	0.01	Beyond this the water becomes toxic.	No Relaxation.	To be tested when pollution is suspected
22.	Arsenic (mg/L, As) Max.	0.01	Beyond this the water becomes toxic	No Relaxation	To be tested when pollution is suspected
23.	Cyanide	0.05	Beyond this the water becomes toxic	No Relaxation	To be tested when pollution is suspected
24.	Lead (mg/L Pb) Max.	0.05	Beyond this the water becomes toxic	No Relaxation	To be tested when pollution is suspected
25.	Zinc (mg/L, Zn) Max.	5	Beyond this limit it can cause astringent taste and an opalescence in water	15	To be tested when pollution is suspected
26.	Anionic detergents (mg/L, MBAS) Max	0.2	Beyond this limit it can cause a light froth in water	1.0	To be tested when pollution is suspected
27.	Chromium (mg/L, Cr6+	0.05	May be carcinogenic above this limit	-	-
28.	Polynuclear Aromatic Hydrocarbons (mg/l, PAH) Max	-	May be carcinogenic	-	-
29.	Mineral oil (mg/L)	0.01	Beyond this limit, undesirable taste and odour after chlorination takes place	0.03	To be tested when pollution is suspected
30.	Pesticides (mg/L) max	Absent	Toxic	0.001	-
Radioactive materials					
31.	Alpha emitters Bq/L Max	-	-	0.1	-
32.	Beta emitters Pci/L Max	-	-	1.0	-
33.	Alkalinity (mg/L,) Max	200	Beyond this limit, taste becomes unpleasant	600	-
34.	Aluminum (mg/L, Al) Max	0.03	Cumulative effect is reported to cause dementia	0.2	
35.	Boron (mg/L) Max	1.0	-	5.0	-

FOREST COVERAGE IN WEST BENGAL

Table A3: District-Wise Forest Area

S. No.	District	Geographical Area (km^2)	Recorded Forest Area (km^2)	Percentage of Age of Recorded Forest Area (%)
1	24-Parganas (S)	10,159	4,221	41.54
2	Darjeeling	3,149	1,204	38.23
3	Jalpaiguri	6,227	1,790	28.75
4	Bankura	6,882	1,482	21.53
5	Purulia	6,259	876	14.00
6	Midnapur	14,081	1,709	12.14
7	Burdwan	7,024	277	3.94
8	Birbhum	4,545	159	3.50
9	Cooch Behar	3,387	57	1.68
10	24-Parganas (N)	3,997	43	1.08
11	Malda	3,733	20	0.54
12	Dakshin Dinajpur	2,219	8	0.36
13	Uttar Dinajpur	3,140	10	0.32
14	Nadia	3,927	12	0.30
15	Mushidabad	5,324	8	0.15
16	Hooghly	3,149	3	0.10
17	Calcutta	104	-	0.00
18	Howra	1,467	-	0.00
	Total	**88,752**	**11,879**	**13.38**

PROTECTED AREAS IN WEST BENGAL (WILDLIFE SANCTUARIES, NATIONAL PARKS AND BIOSPHERE RESERVES)

Table A4. National Parks and Wildlife Sanctuaries

S. No.	Name of the Protected Areas	Year of Establishment.	Area (km^2)	District(s)
A.	**National Parks (NP)**			
1	Buxa NP	1992	117.10	Jalpaiguri
2	Gorumara NP	1992	79.45	Jalpaiguri
3	NeoraValley NP	1986	88.00	Darjeeling
4	Singalila NP	1986	78.60	Darjeeling
5	Sunderban NP	1984	1330.10	North and South 24-Parganas
B	**Wildlife Sanctuaries (WLS)**			
1	Ballavpur WLS	1977	2.02	Birbhum
2	Bethuadahari WLS	1980	0.67	Nadia
3	Bibhutibhusan WLS	1980	0.64	North 24-Parganas
4	Buxa WLS	1986	368.99	Jalpaiguri
5	Chapramari WLS	1976	9.60	Jalpaiguri
6	Chintamani Kar Bird Sanctuary	1982	0.10	South 24-Parganas
7	Haliday Island WLS	1976	5.95	South24-Parganas
8	Jaldapara WLS	1976	216.51	Jalpaiguri
9	Jorepokhri Salamander WLS	1985	0.04	Darjeeling
10	LothianIsland WLS	1976	38.00	South 24-Parganas
11	Mahananda WLS	1976	158.04	Darjeeling and Jalpaiguri
12	Raiganj WLS	1985	1.30	North Dinajpur
13	Ramnabagan WLS	1981	0.14	Burdwan
14	Sajnakhali WLS	1976	362.40	South 24-Parganas
15	Senchal WLS	1976	38.88	Darjeeling

Source: West Bengal Forest Department (http://www.westbengalforest.gov.in/).

KOLKATA PORT TRUST PERMISSION FOR INTAKE/WORKS IN OR NEAR HOOGHLY RIVER: PROCEDURE AND APPLICATION FORM

Procedure for grant of permission for construction u/s 46 of MPT Act

Under Section 46(1) of MPT Act, prior permission of KoPT Board is required for making, erecting or fixing within the port limits or port approaches any wharf, dock, quay, stage, jetty, pier, erection or mooring or undertaking any reclamation of foreshore within the said limit. The port limit is that part of River Hooghly and shores thereof as are within 45.7 mtrs. of High Water Mark at Spring Tide and extends from Jangipur in the North to Sandheads in the South. Considering the large number of private and public properties in the entire stretch, the following procedures and guidelines have been drawn up for grant of permission u/s 46 of MPT Act :-

1. The Board may permit construction of public utilities, parks, gardens, beautification, bathing ghats, jetties and other activities which essentially require a waterfront. Apart from these, any permanent construction as per Municipality approved plan may also be permitted subject to the following :-

i) The developer/land owner/authorized agency would undertake bank protection works based on detailed study report/recommendation of any of the three reputed institutes in Bengal, viz. Jadavpur University, BESU or IIT, Kharagpur. Presence of KoPT's Surveyor would be essential during inspection for drawing up the recommendation/study report. Concurrence of KoPT to the methodology recommended by the Institutes would be necessary. The bank protection work should be executed by the party and certified by the concerned Institute. The periodical maintenance of bank protection would have to be carried out by the developer/land owner/authorised agency as per plan to be given by the above institutes.

ii) No changing of bank line will be allowed and no encroachment into the river will be allowed in the name of bank protection work.

iii) For conservancy purposes, a paved clear corridor fit for vehicular movement of 11 mtrs. (3-lane width) from High Water Mark at Spring Tide should be maintained by the developer/land owner/authorized agency and provide access to the said corridor. Depending upon erosion potential of a particular stretch of river bank, the 11 mtrs. clear corridor may also be increased.

iv) Restriction on construction of deep tube well within port limits would apply, depending on location.

v) In case of any unprecedented hydromorphological changes in the river, KoPT shall not be responsible in any manner for any consequential effect on the construction and stability of the structures falling within the port limits.

vi) The above conditions would be applicable in respect of all future constructions, irrespective of existence of already sanctioned plans from concerned Municipality.

2. KoPT may invoke Section 46(2) for removal of any construction done without prior permission of the Board.

3. In cases of permission granted to developers for authorized construction, foreshore occupation charge for 30 years will be recovered as one time upfront value from the developer.

4. While applying for permission u/s 46, a processing fee of Rs. 11,000/- per application plus applicable taxes will be payable. Apart from the processing fee, other applicable dues/charges like foreshore occupation charge, fee for beautification, inspection charge, etc. would be payable.

5. An Inspection fee of Rs. 1.10 lakh will be payable on grant of permission for construction.

6. Both Processing Fee and Inspection Fee would be reviewed after every 2 years. Service tax and any other applicable tax/cess would be payable over and above the fees.

7. Attempts will be made to process applications accompanied by requisite map, plan, drawing in the prescribed format within three weeks of getting relevant documents. For time bound processing of applications, the same should be submitted as per proforma attached.

Proforma application for grant of construction
permission u/s 46 of the MPT Act, 1963

The Secretary,
General Administration Department,
Kolkata Port Trust,
15, Strand Road,
Kolkata – 700 001.

Sub: Request for construction within port limits.

Sir,
I/we propose to construct----------(brief description of the proposed construction) at ---------- (name of area). I/We am/are authorized to undertake the construction activ ity being owner of the land/public utility concern/…. (any other authorization). Necessary information/documents as required for processing the applicationfor grant of permission u/s 46 of MPT Act, 1963 is furnished as follows :-

I. Area of proposed construction demarcated on latest Hydrographic Survey Chart of KoPT which is available for sale at the DMD's Drawing Office. 5 copies of such location chart with a copy of money receipt towards payment of cost of chart to be furnished with the application.

II. Detailed project plan with engineering drawing, where applicable, clearly showing area falling within 45.7 m. of High Water Mark at Spring Tide (5 copies) and protrusion of structure into the river from the bank.

III. Tentative period of construction.

IV. Purpose of construction.

V. Complete address of applicant, PAN/TAN and contact numbers (both mobile & land line) for communication. In case of firm/company, name, address and phone number of Proprietor/Partner/Director to be furnished.

2. I/We hereby declare that Kolkata Port Trust will not be held responsible for any dispute over the land on which construction is proposed.

3. I/We hereby agree to pay processing fee of Rs. 11,000/- (Rupees Eleven Thousand) with applicable taxes and other applicable charges like Hydrographic Survey Charges, Impact Assessment Study Charges, Foreshore Occupation Charge, Beautification Fee, Inspection Charge with applicable taxes as may be claimed by Kolkata Port Trust. I/We also undertake that I/We will abide by all the rules/regulations as well as terms/ conditions of Kolkata Port Trust and other statutory bodies and local authorities in connection with the proposed construction.

4. I/We also hereby declare that no construction will be carried out by us until valid permission is granted to me/us by KoPT. It is requested that our/my application may be considered favourably.

Yours faithfully,
Signature
(Name of the applicant)

LIST OF ARCHEOLOGICAL SURVEY OF INDIA PROTECTED MONUMENTS IN WEST BENGAL

	Name of Monument / Sites	Location	District
1.	Chandraketu's Fort	Berachampa	24 Parganas (North)
2.	Ancient mound known as Barah Mihirer Dhipi also known as Khana Mihirer Dhibi	Deulia and Kaukipara	24 Parganas (North)
3.	Clive's House Dum Dum known as Barakothi	Dum Dum	24 Parganas (North)
4.	26 Siva Temples	Barrakpore – Khardah	24 Parganas (North)
5.	Warren Hasting's House	Barasat	24 Parganas (North)
6.	Jhater Deul Temple	Jhata	24 Parganas (South)
7.	Ancient Temple	Bahulara	Bankura
8.	Dalmadal Gun and the platform on which it is mounted	Bishnupur	Bankura
9.	Gate of Old Fort	Bishnupur	Bankura
10.	Jore Mandir	Bishnupur	Bankura
11.	Jore Bangla Temple	Bishnupur	Bankura
12.	Kalachand Temple	Bishnupur	Bankura
13.	Lalji Temple	Bishnupur	Bankura
14.	Madan Gopal Temple	Bishnupur	Bankura
15.	Madan Mohan Temple	Bishnupur	Bankura
16.	Malleswar Temple	Bishnupur	Bankura
17.	Murali Mohan Temple	Bishnupur	Bankura
18.	Nanda Lal Temple	Bishnupur	Bankura
19.	Patpur Temple	Bishnupur	Bankura
20.	Radha Binod Temple	Bishnupur	Bankura
21.	Radha Gobinda Temple	Bishnupur	Bankura
22.	Radha Madhab Temple	Bishnupur	Bankura
23.	Radha Shyam Temple	Bishnupur	Bankura
24.	Rasmancha	Bishnupur	Bankura
25.	Shyam Rai Temple	Bishnupur	Bankura
26.	Small sateway of fort	Bishnupur	Bankura
27.	Stone chariot	Bishnupur	Bankura
28.	Saileswar Temple	Dihar	Bankura
29.	Sareswar Temple	Dihar	Bankura
30.	Temple of Radha Damodar Jew	Ghatgoria	Bankura
31.	Gokul Chand Temple	Gokulnagar	Bankura
32.	Temple of Ratneswar	Jagannath pur	Bankura
33.	Temple of Shyam Sunder	Madanpur	Bankura
34.	Temple site now represented only by a mound and a statue of Surya	Pareshnath	Bankura
35.	Temple site of an old Jain Temple now represented only by a Mound with a Jain statue	Pareshnath	Bankura
36.	Image of Durga slaying Mahisasura under a tree	Sarengarh	Bankura
37.	Temple site now represented only by a mound	Sarengarh	Bankura
38.	Temple site now represented only by a Mound with statues of Ganesh and Nandi on it	Sarengarh	Bankura
39.	Temple site now represented only by a mound with an Image of Nandi on it	Sarengarh	Bankura
40.	Rock Inscription of Chandra Varman	Susunia Hill	Bankura
41.	Temple of Radha Binod commonly known as Joydeb	Joydeb-Kenduli	Birbhum
42.	Temple of Dharmaraj	Kubilashpur	Birbhum
43.	Two mounds	Bhadeswar	Birbhum
44.	Temple of Basuli and the mound together with fourteen other temples near them containing the Linga images of Shiva	Nanoor	Birbhum
45.	Temple and Rasmancha (Damodar Temple)	Suri	Birbhum
46.	Two ancient temples (joined together)	Baidyapur	Burdwan
47.	Rudreswar Temple	Bamunara	Burdwan

	Name of Monument / Sites	Location	District
48.	Group of four Ancient Temples	Begunia	Burdwan
49.	Tomb of Baharam Sakka, Sher Afghan and Nawab Qutabuddin	Burdwan	Burdwan
50.	Stone Temple	Garui	Burdwan
51.	Temple of Ichai Ghosh	Gourangpur	Burdwan
52.	Ancient site	Nadhia	Burdwan
53.	Jain brick temple known as Sat-Deul	Deulia	Burdwan
54.	Group of temples (12 nos. temples) (i) 1 Bijoy Vaidyanath Temple (ii) 2 Giri Gobardhan Temple (iii) 3 Gopalji Temple, (iv) Jaleswar Temple (v) Krishna Chandraji Temple (vi) Lalji Temple, (vii) Nava-Kailasha Temple (viii) Pancharatna Temple (ix) Pratapeswar Siva Temple in Rajbari compound (x) Rameswar Temple, (xi) Ratneswar Temple (xii) Rupeswar Temple	Kalna	Burdwan
55.	Ancient site and remains of Panduk Rajar Dhipi	Panduk	Burdwan
56.	Ancient mound	Bharatpur	Burdwan
57.	Cooch Behar Palace	Cooch Bihar	Cooch Bihar
58.	Rajpath Site	Khalsa Gasanimari	Cooch Behar
59.	Tomb of Alexander-Cosma de Koros	Darjeeling	Darjeeling
60.	Tomb of General Llyod	Darjeeling	Darjeeling
61.	Dargah of Shah Ata	Ganga Rampur	Dinajpur (South)
62.	Mounds	Bangarh (Ganga rampur)	Dinajpur (West)
63.	Haneswari and Vasudev temples	Bansberia	Hooghly
64.	Dutch Cemetery together with all tombs and monuments contained therein	Chinsurah	Hooghly
65.	Dutch Memorial monument of Susan Anna Maria	Chinsurah	Hooghly
66.	Group of temples known as Brindaban Chandra's Math	Guptipara	Hooghly
67.	Mounds	Mahanad	Hooghly
68.	Minar	Pandua	Hooghly
69.	Mosque	Pandua	Hooghly
70.	Mosque and Tombs	Satgaon	Hooghly
71.	i) Danish Cemetery ii) All ancient structures, all tombs stone monument remains and inscriptions within the area enclosed by the said walls	Serampore	Hooghly
72.	Shrine and Mosque known as Dargah of Zafar Khan Gazi	Tribeni	Hooghly
73.	Dupleix Palace(Institute de Chandan Nagar)	Chandan Nagar	Hooghly
74.	Sri Mayer Ghat	Howrah	Howrah
75.	Metcalfe Hall	Kolkata	Kolkata
76.	St. John's Church (Fabrics of the Church) (final notification not issued)	Kolkata	Kolkata
77.	Currency Building	Dalhousie Square	Kolkata
78.	Asiatic Society Building	Park Street	Kolkata
79.	Maghen David Synagogue	Ward No. 45	Kolkata
80.	Beth-el-Synagogue	Pollock Street	Kolkata
81.	Adina Mosque	Pandua (Adina)	Malda
82.	Baisgazi Wall	Gaur	Malda
83.	Baraduary Masjid or the Great Golden Mosque	Gaur	Malda
84.	Bhita of Chand Sadagar	Gaur	Malda
85.	Chamkati Masjid	Gaur	Malda
86.	Chika Masjid	Gaur	Malda

	Name of Monument / Sites	Location	District
87.	Dakhil darwaza	Gaur	Malda
88.	Firoz Minar	Gaur	Malda
89.	Gumti Gateway	Gaur	Malda
90.	Gunmant Mosque	Gaur	Malda
91.	Kotwali Darwaja	Gaur	Malda
92.	Lottan Masjid	Gaur	Malda
93.	Lukachuri Gateway	Gaur	Malda
94.	Qadam Rasul Mosque	Gaur	Malda
95.	Tomb of Fateh Khan	Gaur	Malda
96.	Tantipara Masjid	Gaur	Malda
97.	Two tombs in front of Tantipura Masjid	Gaur	Malda
98.	Two stone pillars	Gaur	Malda
99.	Tower	Nimasarai	Malda
100.	Eklakhi Mausoleum	Pandua	Malda
101.	Qutub Shahi Masjid	Pandua	Malda
102.	Dharmaraj Temple	Pathra	Midanapur
103.	Temples of Bandyopadhyay Family	Pathra	Midanapur
104.	Sitala Temples	Pathra	Midanapur
105.	Navratna Temple Complex	Pathra	Midanapur
106.	Kurambera Fort	Gaganeswar	Midnapore
107.	John Pierce Tomb	Midnapore	Midnapore
108.	Tomb of Azimunnisha Begum daughter of Murshid Quli Khan	Azimnagar	Murshidabad
109.	Residency Cemetery also known as 'Station Burial ground'	Babulbona Beharampore	Murshidabad
110.	Bhavaniswar Mandir	Baranagar	Murshidabad
111.	Char Bangla group of four Siva Mandirs	Baranagar	Murshidabad
112.	Tomb of Mir Mardan	Faridpur	Murshidabad
113.	Dutch Cemetery	Kalikapur	Murshidabad
114.	Old English Cemetery or Old Residency Burial Ground	Kashim Bazar	Murshidabad
115.	Mosque	Kheraul	Murshidabad
116.	Tomb of Alivardi Khan and the tomb of Seraj-ud-daullah	Khosbag	Murshidabad
117.	Mound known as Barkona Deul Mound	Panchthupi	Murshidabad
118.	Mounds known as the Devil's Mound and Raja Karna's Palace	Rangamati	Murshidabad
119.	Tomb of Sujauddin	Roshnibag	Murshidabad
120.	Tomb and Mosque of Murhsid Kuli Khan	Sabz Katra	Murshidabad
121.	Jahan Kosa Gun	Topkhana	Murshidabad
122.	Hazarduari Palace and Imambara (Murshidabad)	Killa Nizamat	Murshidabad
123.	South Gate, Kella Nezamat	Lalbag	Murshidabad
124.	Imambara, Kella Nezamat	Lalbag	Murshidabad
125.	White Mosque, Kella Nezamat	Lalbag	Murshidabad
126.	Yellow Mosque, Kella Nezamat	Lalbag	Murshidabad
127.	Tripolia Gate, Kella Nizamat	Lalbag	Murshidabad
128.	Nil Kuthi Mound	Mouza Chak ,Chandpara	Murshidabad
129.	Motijheel Jama Mosque	Murshidabad	Murshidabad
130.	Mound known as Bahanpukur Mound or Fort	Bamanpukur	Nadia
131.	Ruins of Fort	Bamanpukur	Nadia
132.	Temple	Palpara	Nadia
133.	Tamluk Rajbati	Padumbasan, Tamluk	Purba Medinipur
134.	Old Temple at Banda	Banda	Purulia

Source: Archeological Survey of India.

DEPARTMENT OF ENVIRONMENT'S DIRECTION UNDER AIR ACT, 1981 FOR CONTROL OF AIR POLLUTION FROM CONSTRUCTION ACTIVITIES IN WEST BENGAL

Department of Environment
Government of West Bengal
Writers' Buildings, "G" Block, (2nd. Floor),
Kolkata-700 001.

No. EN/3170/T-IV-7/001/2009 Dated: December 10th, 2009.

DIRECTION

WHEREAS, Department of Environment, Govt. of West Bengal is entrusted to look after the execution of the different environmental laws within the territorial jurisdiction of West Bengal and also responsible for maintaining pollution free environment and also responsible for restraining different environment hazardous activities which are causing serious impact on human beings, other living creatures, plant, micro-organism, property or the environment ;

AND WHEREAS, Department of Environment has already taken different steps for controlling air pollution in the atmosphere generated from the different sources i.e. industrial source, vehicular source and burning of bio-mass;

AND WHEREAS, Department of Environment in exercising the power conferred under section 19 of the Air (Prevention & Control of Pollution) Act, 1981, has already declared entire West Bengal as `Air Pollution Control Area';

AND WHEREAS, West Bengal Pollution Control Board conducted a study with the help of the Asian Development Bank and it is revealed that the contribution of the construction activities is one of the source of air pollution in Kolkata and its surroundings ;

AND WHEREAS, it is further revealed that burning of old tyres in hot mix plant as a fuel during construction and repairs of road for melting coal tar contributes significant obnoxious element into the air which cause a serious problem of the human beings ;

HENCE, in view of the above and in consultation with the West Bengal Pollution Control Board and in exercise of the power conferred under Air (Prevention & Control of Pollution) Act, 1981 and Environment (Protection) Act, 1986, all the municipalities, local authorities and all other concerned Govt. Departments within the State of West Bengal, are now directed to take immediate steps to implement the following norms which need to be strictly followed by the developers, contractors or any other infrastructure developers ;

- Preventive measures need to be taken: -

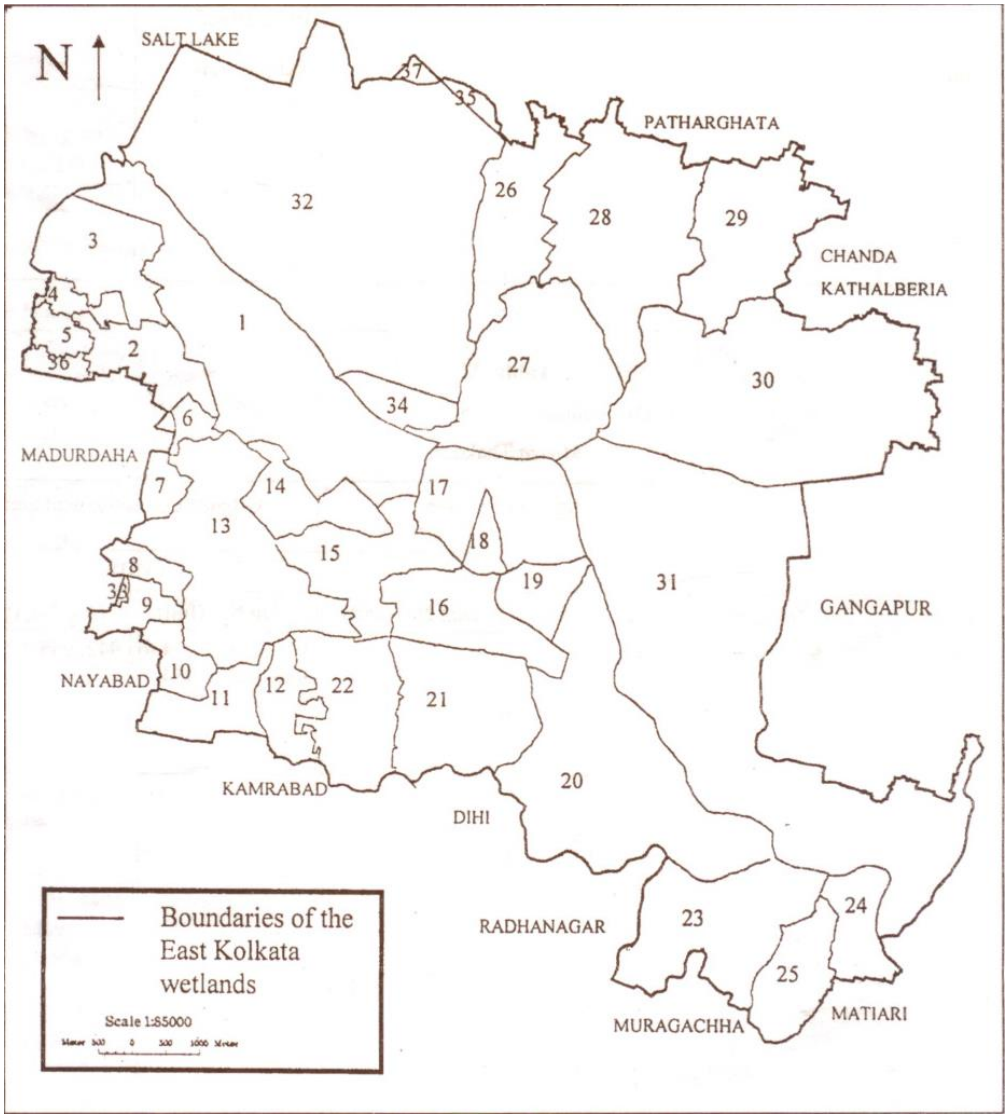
a) Wrap construction area/buildings with geotextile fabric, installing dust barriers, or other actions, as appropriate for the location,
b) Apply water and maintain soils in a visible damp or crusted condition for temporary stabilization,
c) Apply water prior to levelling or any other earth moving activity to keep the soil moist throughout the process;
d) Limit vehicle speeds to 15 mph on the work site.
e) Clean wheels and undercarriage of haul trucks prior to leaving construction site.
f) Apply and maintain dust suppressant on haul routes.
g) Apply a cover or screen to stockpiles and stabilize stockpiles at completion of activity by water and maintain a dust palliative to all outer surfaces of the stockpiles;
h) Stabilize surface soils where loaders, support equipment and vehicles will operate by using water and maintain surface soils in a stabilized condition where loaders, support equipment and vehicles will operate;
i) Stabilize adjacent disturbed soils following paving activities with immediate landscaping activity or installation of vegetative or rock cover.
j) Maintain dust control during working hours and clean track out from paved surfaces at the end of the work shift/day. Track out must now extend 50 feet or more and must be cleaned daily, at the minimum.
k) Stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slope,
l) Disposal of debris in consultation with the local authorities following proper environmental management practice.
m) During construction work, including cutting of marbles, ambient noise level should not exceed more than 65 dB(A).

Local Police Station is also directed to render all necessary help to the Local Authorities to implement the aforementioned direction in a befitting manner.

This order will take effect from 01-01-2010 through out the State of West Bengal.

By Order,
Sd/-
(M. L. Meena)
Principal Secretary to the Govt. of West Bengal.
Department of Environment.

GEOGRAPHICAL EXTENT OF EAST KOLKATA WETLANDS



District	Police Station	Mouza	J.L. No.	S. No. as Shown in the Above
24-Parganas (South)	Tiljola	Dhapa	2	1
		Chowbaga	3	2
		Bonchtala	4	3
		Dhalenda	8	4
		Paschim Chowbaga	9	5
		Nonadanga	10	36
	Sonarpur	Chak Kolar Khal	1	6
		Karimpur	2	7
		Jagatipota	3	8
		Mukundapur	4	9
		Atghara	5	10
		Ranabhutia	6	11
		Kantipota	7	12
		Bhagabanpur	8	13

District	Police Station	Mouza	J.L. No.	S. No. as Shown in the Above
		Kharki	9	14
		Deara	10	15
		Kheadaha	11	16
		Khodahati	12	17
		Goalpota	13	18
		Kumapukuria	14	19
		Tardaha	15	20
		Tihuria	16	21
		Nayabad	17	22
		Samukpota	91	23
		Pratapnagar	92	24
		Garal	93	25
	Kolkata Leather Complex	Dakshin Dhapa Manpur	1	34
		Dhapa Manpur (presently	2	35
		Kochpukur)	4	26
		Hatgachha	5	27
		Hadia	6	28
		Dharmatala Pachuria	7	29
		Kulberia	27	30
		Beonta	38	31
		Tardaha Kapashati		
	Purba Jadabpur	Kalikapur	20	33
24-Parganas (North)	South Bidhan Nagar	Dhapa Manpur	1	32
	Rajarhat	Thakdari	19	37

EXTRACT FROM CONSTRUCTION AND DEMOLITION MANAGEMENT RULES, 2016

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

NOTIFICATION

New Delhi, the 29th March, 2016

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

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

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

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

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

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

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

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

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

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

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

building of infrastructure including alteration in these entities,;

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

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

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

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

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

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

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

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

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

(4) Duties of the waste generator -

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

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

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

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

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

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

(5) Duties of service provider and their contractors -

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

To,
The Member Secretary

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

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

RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST

West Bengal Drinking Water Sector Improvement Project

Subproject: _____

1. 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/damage to these sites?			
▪ Hazard of land subsidence caused by excessive ground water pumping?			
▪ Social conflicts arising from displacement of communities?			
▪ Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?			
▪ Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?			
▪ Delivery of unsafe water to distribution system?			
▪ Inadequate protection of intake works or wells, leading to pollution of water supply?			
▪ Over pumping of ground water, leading to salinization and ground subsidence?			
▪ Excessive algal growth in storage reservoir?			
▪ Increase in production of sewage beyond capabilities of community facilities?			
▪ Inadequate disposal of sludge from water treatment plants?			
▪ Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?			
▪ Impairments associated with transmission lines and access roads?			
▪ Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.			
▪ Health and safety hazards to workers from the management of chlorine used for disinfection and other contaminants?			
▪ dislocation or involuntary resettlement of people			
▪ Social conflicts between construction workers from other areas and community workers?			
▪ Noise and dust from construction activities?			
▪ Increased road traffic due to interference of construction activities?			
▪ Continuing soil erosion/silt runoff from construction operations?			

SCREENING QUESTIONS	Yes	No	Remarks
▪ Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?			
▪ Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?			
▪ accidental leakage of chlorine gas?			
▪ Excessive abstraction of water affecting downstream water users?			
▪ Competing uses of water?			
▪ increased sewage flow due to increased water supply			
▪ increased volume of silage (wastewater from cooking and washing) and sludge from wastewater treatment plant			
▪ Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ Social conflicts if workers from other regions or countries are hired?			
▪ Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?			
▪ Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			
Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	Yes	No	Remarks
▪ Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes.			
▪ Could changes in temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (e.g., changes in rainfall patterns disrupt reliability of water supply; sea level rise creates salinity intrusion into proposed water supply source)?			
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g., high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?			
▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., by using water from a vulnerable source that is relied upon by many user groups, or encouraging settlement in earthquake zones)?			
▪ * Hazards are potentially damaging physical events.			

OUTLINE CONTENTS OF INITIAL ENVIRONMENTAL EXAMINATION REPORT

1. Executive Summary

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

2. Description of the Project

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

3. Policy, Legal, and Administrative Framework

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

4. Description of the Environment (Baseline Data)

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

5. Anticipated Environmental Impacts and Mitigation Measures

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

6. Information Disclosure, Consultation, and Grievance Redress Mechanism

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

7. Environmental Management Plan

- Summarize stage wise (design, construction and operation) environmental impacts and detail mitigation and management measures (Table A11.1)
- Describe monitoring measures (Table A11.2)
- Describe implementation arrangements and responsibilities for EMP implementation

Table A11.1: Summary Environmental Impacts and Mitigation Measures

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

Table A11.2: Environmental Monitoring Plan

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

8. Conclusion and Recommendation

- Provide the conclusions drawn from the assessment and provide recommendations

SAMPLE GRIEVANCE REGISTRATION FORM

(To be available in Bengali and English)

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

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

FOR OFFICIAL USE ONLY

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

PROCEEDINGS OF SUB PROJECT LEVEL STAKEHOLDER CONSULTATION MEETING

Subproject_____ Venue and date_____

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

B. Topics discussed during the meeting

C. Reports / Materials disclosed to the participants

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

Photographs:

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

West Bengal Drinking Water Sector Improvement Project
Stakeholder Consultation Workshop

Subproject:_____ Date:_____Venue:_____

Organized by_____(PIU)

S. No	Name	Designation / Agency	Contact No.	Signature
1				
2				
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Use additional sheets if required.

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

Applicable Component	Anticipated Impact / Issue	Mitigation Measures	Responsibility	
			Mitigation	**Monitoring**
1. Water Supply				
Water source	Source sustainability – lack of water availability	• Establish adequate water availability • Ensure that there are no water use-conflicts • In case of surface water source with multi-uses, ensure that necessary provision is made for respective town water supply through government statute as required before the start of detailed design. • For groundwater source, conduct hydrogeological study and establish source sustainability prior to detailed design	Design, supervision and institutional support consultant (DSISC)/ project implementation unit (PIU)	Project management consultant (PMC)/ project management unit (PMU)
Water treatment plant (WTP)	Water efficiency and pollution issues due to disposal of backwash water and sludge	• Provide recirculation system for backwash water • Provide sludge collection and treatment system (sludge drying beds) • Check the suitability of dried sludge to use as soil conditioner; if not suitable, dispose through landfilling	Contractor / DSISC / PIU	PMC/PMU
Chlorination facility	Risk due to handling and application of chlorine	Design and develop chlorination facility with all safety features and equipment to meet with any accidental eventuality, which may include • Chlorine neutralization pit with a lime slurry feeder • Proper ventilation, lighting, entry and exit facilities • Personal protection and safety equipment for the operators in the chlorine plant • Provide training to the staff in safe handling and application of chlorine; • Provide standard operating manual for safe operation	Contractor / DSISC / PIU	PMC/PMU
All components	Consents, permits, clearances, no objection certificates (NOCs), etc. Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of work • Include all consent conditions in the designs and construction schedules	PIU	PMC/PMU
All component	Operational impacts	• Develop operation and maintenance (O&M) plan, including an environmental monitoring program	Contractor / Public Health Engineering Department (PHED)	PMC/PMU
All components	Loss of vegetation and tree cover	• Avoid tree cutting by suitable site planning • If tree-removal will be required, obtain tree-cutting permit and plant two native trees for every one that is removed.	Contractor / DSISC / PIU	PMC/PMU

Applicable Component	Anticipated Impact / Issue	Mitigation Measures	Responsibility	
Pumping facilities	Energy efficiency	• Design pumping equipment with maximum efficiency to optimize the power consumption • Various combinations of number of pumps, stages, motor speed should be considered to select the best pump with ideal specific speeds. • Specific speeds of the pumps should be selected to achieve maximum efficiency of pumps. As per American Standard for DS Centrifugal Pumps issued by Hydraulic Institute, New Jersey, the specific speed for Pumps should be in the range of 2000 to 3000 for attaining optimum efficiency. The pumps should be designed appropriately. • Attainable efficiency for procuring the pumps and motors should be considered as 88% to 92% for pumps and 94% for motors. It is proposed that during the procurement, the evaluation of bid shall also be in terms of efficiency. • The pumps shall conform to IS 1710 – 1989 Specification for Pump and IS 5120–1992 Technical Requirements for Roto-dynamic Special Purpose Pumps and tested to class 3 of IS: 9137-1978 Code for Acceptance Tests for Centrifugal, Mixed Flow and Axial Flow Pumps.	Contractor / DSISC / PIU	PMC/PMU

GENERIC CONSTRUCTION-STAGE ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES OF WATER SUPPLY PROJECTS

Applicable Component	Anticipated Impact / Issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
1. All Construction Works (water supply and sewerage projects)				
All components	Environment, health and safety issues during construction of civil works	• All the site staff – workers, supervisors, engineers from Contractor, CMC, PIU and ULB will be required to undergo training on EMP implementation, standard operating procedures (SOP) for construction works; occupational health and safety (OHS), core labor laws, applicable environmental laws, etc., prior to start of construction work	Contractor/ DSISC/PIU	PMC / PIU
All components	Health risks associated with Asbestos Cement pipes	• No asbestos cement pipes shall be included in the project; leave the existing Asbestos Cement pipes, if any, in-situ without disturbing • Obtain details from PHED on location of underground Asbestos Cement pipes • Locate the new pipe/sewer carefully to avoid encountering Asbestos Cement pipes	Contractor/ DSISC/ PIU	
All components	Construction work camps, stockpile areas, storage areas, and disposal areas (disruption to traffic flow and sensitive areas and receptors)	• Prioritize areas within or nearest possible vacant space in the subproject location • Construction work camps shall be located at least 200 m from residential areas • Do not consider residential areas for stockpiling the waste/surplus soil • Material stockpiles shall be protected by bunds during the monsoon to arrest the silt laden runoff into drains • Surplus soil from trench excavations (pipeline and sewers) shall be utilized for construction works as far as possible • Identify site for disposal of construction waste/soil	Contractor	DSISC/PIU
All components	Source of construction materials (Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution)	• Contractor should obtain material from existing mines approved/licensed by Mines and Geology Department/ Revenue Department. • Submit a monthly statement of construction material procured indicating material type, source and quantity.	Contractor	DSISC / PIU
All components	Air quality (dust and emissions from construction activity may degrade the air quality)	• Comply with the air pollution / dust control measures for construction activities stipulated by the “Direction of West Bengal Department of Environment under the Air Act, 1981 Direction No. EN/3170/T-IV-7 /001/2009 dated: 10 December 2009”	Contractor	DSISC / PIU

Applicable Component	Anticipated Impact / Issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
		• Damp down exposed soil and any stockpile on site by spraying with water when necessary during dry weather; • Bring materials (aggregates, sand, etc. gravel) as and when required; • Use tarpaulins to cover sand and other loose material when transported by vehicles; • Clean wheels and undercarriage of vehicles prior to leaving construction site • Ensure valid Pollution Under Control (PUC) Certificates for all vehicles and equipment used in the construction activity		
All components	Impacts on surface drainage and water quality due to contaminated runoff from construction areas in monsoon	• Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets • Stockpiles shall be provided with temporary bunds • Prioritize re-use of excess spoils and materials in the construction works. If necessary, dispose spoils only at identified disposal sites • Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies • Place storage areas for fuels and lubricants away from any drainage leading to water bodies • Do not dispose debris and waste soils in or near water bodies/rivers	Contractor	DSISC / PIU
All components	Impacts due to waste soil	• Coordinate with ULB / PIU for beneficial uses of excess excavated soils or immediately dispose to designated areas	Contractor	PMC / PIU
All components	Employment generation	• Employ at least 50% of the labor force from project area if manpower is available	Contractor	PMC / PIU

Applicable Component	Anticipated Impact / Issue	Mitigation Measures	Responsibility	
			Mitigation	**Monitoring**
All components	Occupational health and safety to workers	*Safety at Work Place* • Follow standard and safe procedures for all site activities; do not employ arbitrary procedures • All trenches deeper than 2 m shall be protected with wooden bracing • Ensure that qualified first-aid at all times and be easily accessible • Secure all installations from unauthorized intrusion and accident risks • Provide H and S orientation training to all workers including basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers, etc., • Prohibit / control public entry into work site • Ensure the visibility of workers; use high visibility vests where required • Ensure moving equipment is outfitted with audible back-up alarms; • Provide sign boards easily understood by workers, visitors • Disallow worker exposure to noise level (>85 dBA); use protection • Document of work-related accidents • Provide medical insurance coverage for workers • Provide supplies of potable drinking water at work sites • Provide clean eating areas where workers are not exposed to hazardous or noxious substances • Provide toilet facilities, separate for men and women	Contractor	PMC / PIU

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

Applicable Component	Anticipated Impact / Issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
		however no work should be conducted between 10 PM – 6 AM at any site. • Provide prior information to the local public about the work schedule; • Ensure that there are no old and sensitive buildings that may come under risk due to the use of pneumatic drills; if there is risk, conduct manual work • Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and • Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s		
All linear components	Disturbance/damage to existing utilities on the sites (Telephone lines, electric poles and wires, water lines etc.)	• Identify utilities and services likely to be affected by the construction works (especially linear works like laying of water pipes/sewers) • Coordinate with respective agencies and take necessary measures to minimize disruptions • Prepare a contingency plan to include actions to be done in case of unintentional interruption of services	Contractor	DSISC / PIU
All linear components	Hindrance to traffic movement	• Plan pipeline work in consultation with the traffic police; Prepare a Traffic Movement Plan for the construction work in busy/high traffic /narrow roads • Plan work such that trench excavation, pipe laying, and refilling including compacting, at a stretch is completed in a minimum possible time • Provide for immediate consolidation of backfilling material to desired compaction - this will allow immediate road restoration and therefore will minimize disturbance to the traffic movement • Do not close the road completely, ensure that work is conducted onto edge of the road; allow traffic to move on one line; In unavoidable circumstances of road closure, provide alternative routes, and ensure that public is informed about such traffic diversions • At all work sites public information/caution boards shall be provided – information shall inter-alia include: project name, cost and schedule; executing agency and contractor details; nature and schedule of work at that road/locality; traffic diversion details, if any; entry restriction information; competent official's name and contact for public complaints.	Contractor	DSISC / PIU

Applicable Component	Anticipated Impact / Issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
All linear components	Nuisance/disturbance to sensitive areas (schools, hospitals and religious places) due construction work in the proximity (within 250 m of such place)	• No material should be stocked in this area; material shall be brought to the site as and when required • Conduct work manually with small group of workers and less noise; minimize use of equipment and vehicles • No work should be conducted near the religious places during religious congregations • Material transport to the site should be arranged considering school timings; material should be in place before school starts • Notify concerned schools, hospitals etc., 1 week prior to the work; conduct a 30-m awareness program on nature of work, likely disturbances and risks and construction work, mitigation measures in place, entry restrictions and dos and don'ts • Implement all measures strictly - dust and noise control, public safety, traffic management, strictly at the sites	Contractor	DSISC / PIU
All linear components	Impediment of access to houses and business	• Leave space for access between mounds of excavated soil • Provide wooden planks/footbridges for pedestrians and metal sheets for vehicles to allow access across trenches to premises where required • Consult affected person to inform them in advance when work will occur • Address livelihood issues, if any; implement the Resettlement Plan to address these issues • Provide sign/caution/warning boards at work site indicating work schedule and traffic information; prevent public entry into work sites through barricading and security • Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.	Contractor	DSISC / PIU
All linear components	Trench excavation in in narrow streets will pose high risk to children and elders in the locality	• Provide prior information to the local people about the work • Conduct awareness program on safety during the construction work • Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day • Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches	Contractor	DSISC / PIU
All linear components and components	Community health and safety	• Plan material and waste routes to avoid times of peak-pedestrian activities • Liaise with ULB in identifying risk areas on route cards/maps	Contractor	DSISC / PIU

Applicable Component	Anticipated Impact / Issue	Mitigation Measures	Responsibility	
			Mitigation	Monitoring
located within densely populated areas		• Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure • Provide road signs and flag persons to warn of dangerous conditions, in case of location near the road		

GENERIC OPERATION STAGE ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES OF WATER SUPPLY PROJECTS

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Check for blockage and leakage problems reducing the water losses	Loss of water, increased demand and inconvenience to consumers and general public	Effectiveness of leak detection and water auditing to reduce the water losses	Design built operate (DBO) Contractor	Project management unit (PMU)/ Public Health Engineering Department (PHED)	Operating costs
Water treatment plant (WTP) operation – malfunction and effect on efficiency	Public health, safety and environmental impacts	(i) Operate as per the Operational Manual following Standard Operating Procedures as per the WTP design (ii) Undertake preventive and periodic maintenance activities as required (iii) Ensure periodic training to staff in WTP operation, especially in chemical handling and dosing, filter backwash, etc., (iv) replace pumps, motors and other parts as per the operating life prescribed by manufacturer (v) Maintain the mechanical parts as per the maintenance plan to avoid any hazards (vi) Ensure that all safety apparatus at WTP including personal protection equipment are in good condition all times; and are at easily accessible and easily identifiable place; periodically check the equipment, and conduct mock drills to deal with emergency situations (vii) Ensure that backwash recirculation system and sludge management system are operated as per the manual	DBO Contractor	PMU / PHED	Operating costs
Occupational health and safety	Health, social and economic impacts on the workers	(i) Provide appropriate PPE and training on its proper use and maintenance. (ii) Use fall protection equipment when working at heights. (iii) Maintain work areas to minimize slipping and tripping hazards. (iv) Implement a training program for operators who work with chlorine regarding safe handling practices and emergency response procedures. Prepare escape plans from areas where there might be a chlorine emission. (v) Install safety showers and eye wash stations near the chlorine equipment and other areas where hazardous chemicals are stored or used. (vi) Prohibit eating, smoking, and drinking except in designated areas.	DBO Contractor	PMU / PHED	Operating costs
Increased in sewage generation	Water pollution, and impacts on public health and environment	(i) Sanitation and sewerage/septage facilities needs to be improved/provided in the project area to suit the increased sewage generation	PHED and respective local bodies	PMU	To be identified

APPLICATION FORM FOR TREE CUTTING PERMISSION

Form - I (A)

Application for Felling / Disposing of Tree in Non-Forest Areas in respect by a Person (Other than a Developer)
[See Rule 4(2)(a)]

1) **Name of the Applicant** (In Capitals) :

2) **Full Postal Address :**

3) **Land Details :**
   a) Block / Panchayet/ Municipality / Corporation / others :
   b) Mouza / Ward :
   c) J.L.No. / Part No. / Plot No. :
   d) Area of the land :
   e) Plan / Map of the land :
   f) Total No. of trees present in the land (Species & number) :

4) **Details of Trees to be felled / disposed off :**

No. of Tree	Plot No.	Species	DBH(Cm)	Approx height.(Mtr)	Natural or planted.	Approx age.	Physical condition

5) **Purpose of Felling :** (To be authenticated by supporting documents in original)

6) **Particulars of previous felling of trees :**
(On the same plot of land, if any)

Plot No.	Date	Species	Number of Trees	References of permission from the Competent Authority

7) **[Only for application seeking emergency permission]**

I, hereby declare that the aforesaid trees constitute immediate danger in view of _____(Give reasons) and permission for their immediate felling is solicited in terms of sub-rule (4) of rule 4 (**Photographic evidence to be submitted**)

8) I do hereby, certify that the felling of trees for which permission is sought for, shall not change the nature or character of land or the mode of use of the land;

OR

A copy of the conversion certificate obtained from the Collector under section 4C of the West Bengal Land Reforms Act, 1955 is attached.;

9) **[Only in case of Tea Gardens]**
I, do hereby declare that the sale proceeds from the felling of trees in question will be utilized strictly for the purpose of welfare of the labourers of the tea garden on the basis of the specific scheme framed under the provisions of the Plantations Labour Act, 1951 (A copy enclosed)

10) I do, hereby undertake to plant _____ trees (A minimum of two trees against each tree to be felled) at the same plot / at _____ Police Station____ _____ District_____ and maintain the same for a period of 5 (five) years.

I am willing to deposit the security money as prescribed under sub-rule (3) of rule 5.

OR

I, do hereby undertake, to deposit the required sum of money as prescribed under sub-rule (3) of rule 6 in-lieu of plantation to the Competent Authority.

OR

I, may kindly be **exempted from the obligation of planting trees** /permitted to plant lesser no. of trees/permitted to plant trees on a different plot on the following grounds:

i)

ii)

iii)

11) I, am enclosing an amount of Rs._____ as application fee by Cash/Draft No._____ at Bank _____ dated _____

Place :

Date :

Signature of the Applicant

*Strike off which is not applicable.

APPLICATION FORM FOR ARCHEOLOGICAL SURVEY OF INDIA PERMISSION

Form I
(See rule 5)

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

1. Name of the applicant :

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

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

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

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

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

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

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

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

(a) Distance from the main monument:

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

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

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

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

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

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

13 Approximate date of the commencement of the proposed works:

14 Approximate duration for completion of the proposed work:

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

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

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

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

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

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

21. Remarks/additional information, if any:

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

Place:

Seal of firm (if any)

Date: Signature of the applicant

Note:

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

SAMPLE CONSTRUCTION SITE CHECKLIST FOR ENVIRONMENTAL MANAGEMENT PLAN MONITORING

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

SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT TEMPLATE

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

I. INTRODUCTION

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

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

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

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

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

II. COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS[a]

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

[a] All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as Appendix all clearance obtained during the reporting period. If already reported, specify in the "remarks" column.

[b] Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)

[c] Specify if obtained, submitted and awaiting approval, application not yet submitted.

[d] *Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.*

III. COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

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

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

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

Package-wise IEE Documentation Status

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

- For each package, provide name/s and contact details of contractor/s' nodal person/s for environmental safeguards.

Package-wise Contractor/s' Nodal Persons for Environmental Safeguards

Package Name	Contractor	Nodal Person	Email Address	Contact Number

- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below

Summary of Environmental Monitoring Activities (for the Reporting Period)[a]

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

[a] Attach Laboratory Results and Sampling Map/Locations.

Overall Compliance with CEMP/ EMP

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

V. APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

- Briefly describe the approach and methodology used for environmental monitoring of each sub-project.

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

- Discuss the general condition of surroundings at the project site, with consideration of the following, whichever are applicable:

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

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

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

Air Quality Results

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

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

Water Quality Results

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

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

Noise Quality Results

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

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

VII. GRIEVANCE REDRESS MECHANISM

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

VIII. COMPLAINTS RECEIVED DURING THE REPORTING PERIOD

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

IX. SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

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

X. APPENDIXES

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- all supporting documents including **signed** monthly environmental site inspection reports prepared by consultants and/or contractors
- Others

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name
Contract Number

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

WEATHER CONDITION:
_____

INITIAL SITE CONDITION: _____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory _____ Incident _____Resolved _____ Unresolved _____

INCIDENT:
Nature of incident:
_____

Intervention Steps:
_____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

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

Site Restored to Original Condition Yes [ ] No [ ]

Signature
_____

Sign off

Name
Position

Name
Position