

Environmental Manual for Urban Local Bodies

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A. INTRODUCTION & PURPOSE OF THE MANUAL

Environmental degrading is, often, a recurring phenomenon in the urban landscape. It is imperative that urban planners take into account the environmental consequences of urban development projects before commissioning them. It is equally important to put in place mechanisms and measures to mitigate the negative environmental consequences that emanate from urban development projects. This environmental manual has been devised to assist and help the project implementing agencies at the ULBs to ensure that sub-project interventions are environmentally sound and sustainable.

Purpose and Objectives

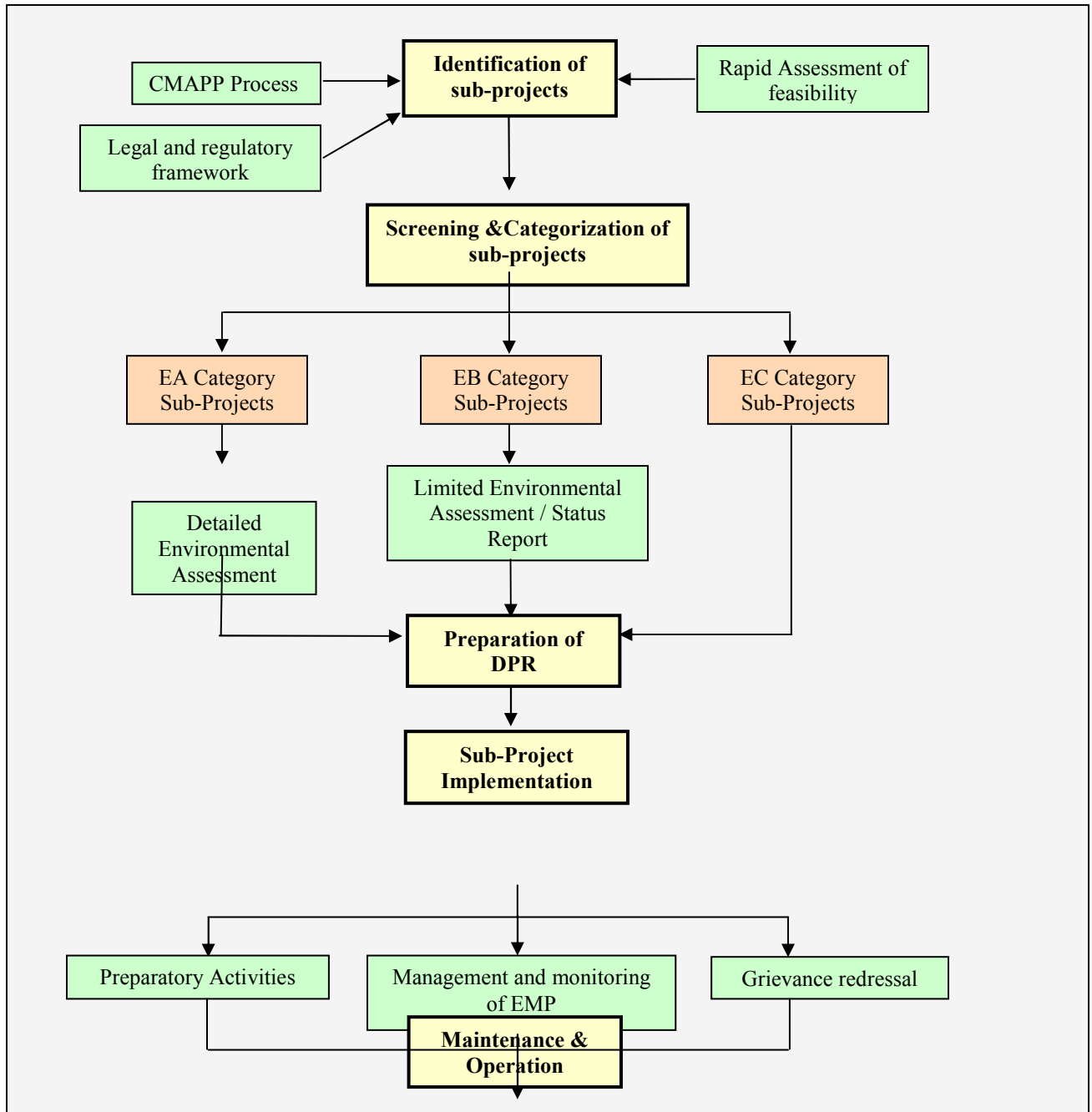
It is important for those who would be using the manual to know what the purpose behind preparing the manual is and how it can be useful to them. The manual can be used as a guide and as a reference to the ULB staff while implementing the sub-projects. The primary purpose of the manual is to ensure that the sub-projects are environmentally sound and also ensure that there is a positive flow of benefits through the project. The manual would help ULBs to:


- Prepare environmentally sound sub-project investments
- Identify and mitigate potentially negative environmental impacts by undertaking appropriate ameliorative steps while planning the sub-projects
- Ensure participation of the community and the affected people in designing, implementing, managing and monitoring sub-projects

The manual contains the following:


- Section B: A environmental sub-project flow chart
- Section C: Sub-project Categorization
- Section D: A description of key environmental activities at different stages in a sub-project cycle and link documents
- Section E: How to use the Documents

B. FLOW CHART FOR ENVIRONMENTAL MANAGEMENT OF SUBPROJECTS



 Key Stages in Sub-project Cycle

 Environmental Tasks

 Categorized Sub-projects

C. ENVIRONMENTAL CATEGORISATION OF SUB-PROJECTS

A pre classified / categorized list of identified subprojects under this Project APURMSP has been provided in document 3 for the easy reference of the ULBs. The concept employed for the categorization is said below.

Category – EA sub-projects

An identified sub project is categorized as EA if it is likely to have significant adverse environmental impacts that are sensitive, diverse or unprecedented. These impacts may affect an area broader than the sites or facilities subjected to the physical work or be limited to the sub-project intervention area. Sub-projects under this category need a detailed environmental impact assessment and also need well-drafted management and monitoring plans to understand and mitigate these impacts.

Category – EB sub-projects

Sub-projects under this category are less adverse than those that fall under the Category – A. These impacts are site specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily for these projects. An environmental status report identifying the positive and negative impacts, a sub-project appraisal document and a project information document will have to be prepared for these sub-projects.

Category –EC sub-projects

Sub-projects in this category are likely to have minimal or no adverse Environmental impacts. Beyond screening no further Environmental assessment is required for these sub-projects.

Note

If sub-project intervention area includes environmentally sensitive locations (refer Document 7), then detailed Environmental Assessment limited to the environmentally sensitive location must be undertaken, irrespective of whether the sub-project is categorized as EA, EB or EC.

D. ACTIVITY DESCRIPTION OF THE FLOW CHART FOR THE ENVIRONMENTAL MANAGEMENT OF SUB-PROJECTS

Sl. No.	Activity	Sub Activity	Description	Reference Documents
1.	Sub-project identification and prioritisation	Include Environmental concerns in the CMAPP Process	<ul style="list-style-type: none"> • Include key environmental issues / parameters / problems in identifying and prioritizing the investments. • Identify all the possible alternative sites / locations / alignments for all the identified investments through consultations with key stakeholders 	CMAPP (APUSP) guidelines CIIP guidelines Document 1 – Flowchart of CMAPP Process Document 2 – format for public consultations
		Consultations at sub-project level	Stakeholders may be consulted at this stage in order to: <ul style="list-style-type: none"> • Ensure that each sub-project would take into account the present /future environmental problems in identifying the investments. • Build consensus with the stakeholders in the investment area to ensure public cooperation and contribution for investments. • Suggestions and complaints to be considered at design, construction and operational phases. • List out the environmentally sensitive locations intervening with the proposal. • Various alternatives to the identified problems should be discussed during consultations w.r.t. alternative investment, alignment, technology, management etc.. 	Document 2 – format for public consultations Document 3 – Information and Consultation strategy (ICS)
		Reconnaissance Survey	Reconnaissance survey covering the complete area of subproject should be done to capture the following. <ul style="list-style-type: none"> • List of environmentally sensitive locations intervening with the proposal. • Existing infrastructure facilities that would be disturbed. • Record/ map the alternatives identified for the proposal. 	Document 4 – List of Environmentally sensitive locations.
2.	Categorization of sub-projects	Categorization of sub-projects	With reference to the list of environmentally categorized sub-projects, categorize the proposed subprojects as 'EA', 'EB' or 'EC'.	Document 5 –Environmental categorization of subprojects.
3.	Data collection	'EA' and 'EB' categorized sub-projects	<ul style="list-style-type: none"> • Environmental baseline data must be collected for detailed environmental assessment in case of 'EA' sub-projects and for the preparation of Status Report for 'EB' sub-projects. • Detailed Physical survey covering the complete subproject area with focus on the necessary data for assessment is required. • The consultants shall do this in assistance from the concerned authorities. 	Document 6 – Format for data collection for assessment

Sl. No.	Activity	Sub Activity	Description	Reference Documents
			<ul style="list-style-type: none"> ‘Document 6’ provides minimum data requirements for assessment. The actual breadth and depth of data required depend on the various parameters of the investment and are specific to the subproject. 	
4.	Environmental Assessment of sub-projects	Sub-projects categorized as ‘EA’	<ul style="list-style-type: none"> Detailed environmental assessment for the overall sub-project is mandatory. This would be done through consultants with environmental expertise. If the sub-project is categorized as EA only because it intervenes with an environmentally sensitive location/site/zone/structure (other wise it would be EB or EC), environmental assessment should be done and could be limited to that environmentally sensitive intervention area only. Subprojects categorized as EA w.r.t. Environmental categorization list provided and due to intervention with the environmentally sensitive locations, then a detailed assessment with special emphasis on the sensitive locations should be done. The assessment should include EMP. The documents 9 & 10 provide general EMP and are only a reference. Site-specific EMPs will have to be prepared by consultants. Relevant measures shall be considered and incorporated in the design of the subproject to mitigate adverse impacts during construction and operation. If external help or technical assistance is required, the ULBs may approach the C&DMA. The C&DMA would identify and select suitable consultants/agencies through a tendering process. 	<p>Document 4 –list of environmentally sensitive locations Document 7 - Key Environmental Standards Document 8 – Possible environmental impacts Document 9 – Guidelines for environmental assessment Document 10- Environmental legislations and policies Document 11 – Environmental Management Plan Document 12 – Environmental Monitoring Plan Document 13 – TOR guidelines for Environmental Assessment Document 14 – TOR guidelines for Landfill operation Document 15 – Cultural Property Management Plan</p>
		Sub-projects categorized as ‘EB’	<ul style="list-style-type: none"> A limited assessment or a status report is to be prepared for the subproject. This would be done through consultants with environmental expertise till the ULBs build necessary capabilities. The assessment should include EMP. The documents 9 & 10 provide general EMP and are only a reference. Site-specific EMP s will have to be prepared by consultants. Relevant measures shall be considered and included in the design of the subproject to mitigate adverse impacts during construction and operation. If external help or technical assistance is required, the ULBs may approach the C&DMA. The C&DMA would identify and select suitable consultants/agencies through a tendering process. 	<p>Document 7 - Key Environmental Standards Document 8 – Possible environmental impacts Document 9 – Guidelines for environmental assessment Document 10- Environmental legislations and policies Document 11 – Environmental Management Plan Document 12 – Environmental Monitoring Plan Document 13 – TOR guidelines for Environmental Assessment</p>
		Sub-projects categorized as ‘EC’	No assessment or status report needs to be prepared.	

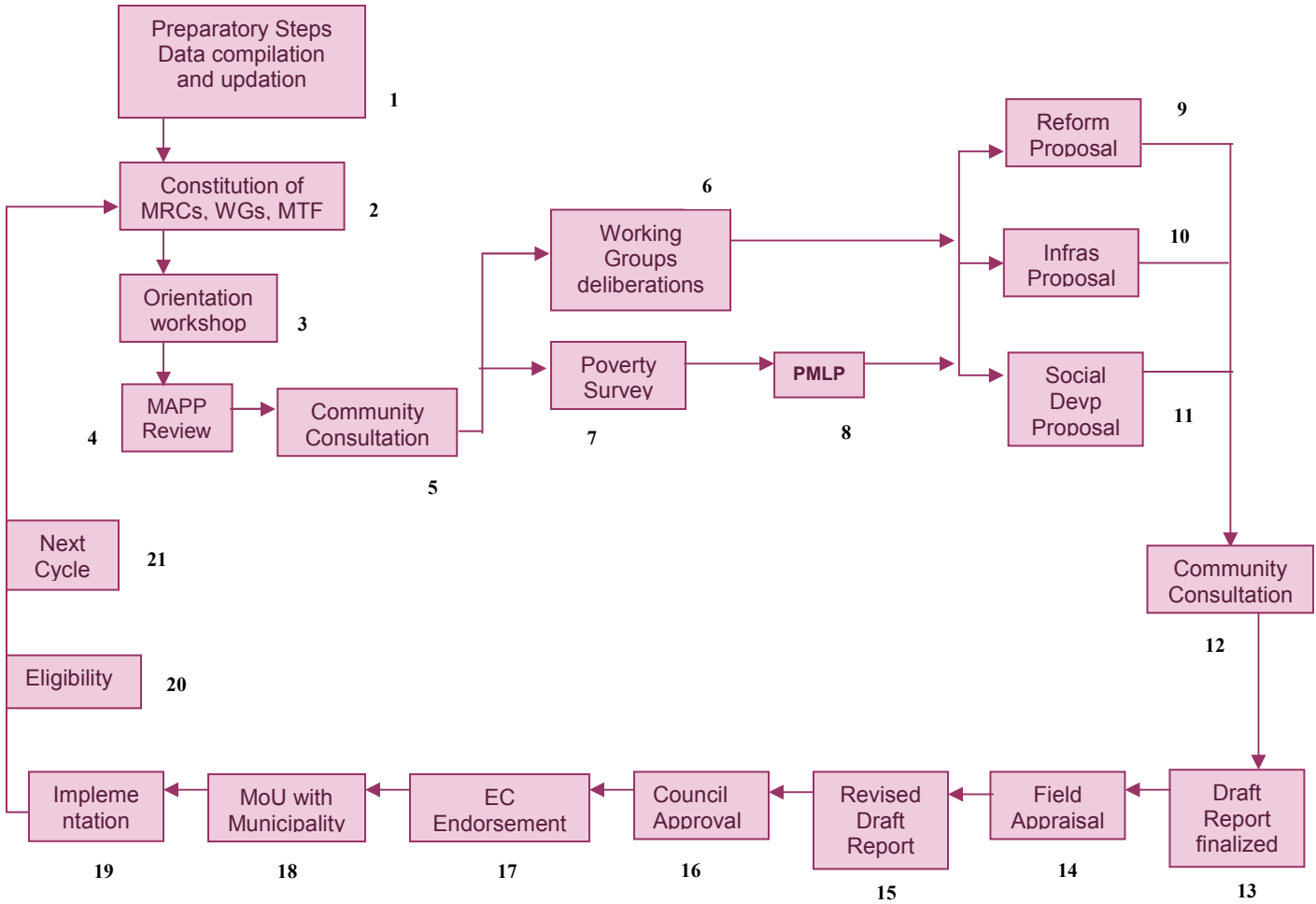
Sl. No.	Activity	Sub Activity	Description	Reference Documents
		<i>Consultations</i>	Public Consultations during assessment for the 'EA' / 'EB' sub-projects is to identify alternatives/ suggestions that would be considered in the detailed report. It is also for the sharing of information and inviting comments on assessment reports.	Document 3 – Information and Consultation strategy (ICS) Document 10 - Environmental legislations and policies
5.	Detailed Project report (DPR)	Clearance from MSU/PCB	Include Detailed Environmental Assessment for EA categorized and Status Report for EB categorized sub-projects with EMP in Detailed Project Report for the approval from MSU/ PCB.	Document 10 – Environmental legislations and policies
		Disclosure of information (approval stage)	Once the sub-project is approved for funding, then: <ul style="list-style-type: none"> DPR shall be disclosed and discussed with the public and made available at the subproject location. NGOs/Communities/CBOs to be identified to form task forces for the monitoring of work during construction and operation. 	Document 3 – Information and Consultation strategy (ICS)
6.	Contractors 'BID' documents for tendering	Inclusion of environmental management and monitoring plans	Environmental management and monitoring plans with costs shall be included in the contractors BID documents for tendering.	Document 10 – Environmental legislations and policies Document 13 – TOR guidelines for including EMP in the contract.
7.	Sub-project implementation	Implementation of Environmental management and monitoring plans	The ULB should ensure that the environmental management and monitoring plans are being implemented during the sub-project construction and operation. This could be done with the help of task forces formed through communities / NGO's / ULB staff.	Document 11 – Env. Management Plan Document 12 – Env. Monitoring Plan Document 7 – Key Environmental Standards Document 16 – Information on Pest Management
		Consultations during implementation	During implementation and operation of the subproject, interactions with focus groups and PAPs are required: <ul style="list-style-type: none"> To assess the quality of construction To address the complaints those arise during construction To check the status of environmental management & monitoring For grievance redressal 	Document 3 –Information and Consultation strategy (ICS) Document 7 - Key Environmental Standards
8.	Sub-project operation & maintenance	Monitoring the sub-project at the operation phase	After implementation of sub-project, effective operation & maintenance is necessary to ensure compliance with environmental safeguards.	Document 11 – Environmental Management Plan
		Community based task forces / NGOs	Community task forces from the subproject intervention area or NGOs for O&M and / or environmental monitoring of operational phase may be employed as per the requirement and feasibility.	Document 12 – Environmental Monitoring Plan Document 7 - Key Environmental Standards

E. USING THE DOCUMENTS

Document	Name of the document	Using the document
Document 1	Flow Chart of CMAPP Process	This document details CMAPP process in a flowchart, being implemented in Class-I towns under APUSP. This process is participatory and transparent in nature and ensures the participation of community in identifying the subprojects. This document will be very useful to the Class-II and Class-III towns which are not acquainted with the CMAPP process for identifying and prioritizing sub-projects. More information in this regard can be obtained from APUSP.
Document 2	Format for Public Consultations	Documentation of consultations is extremely important to ensure that the suggestions, observations and discussions made by the community are incorporated into the project design. Document-2 is a format for public consultations which can be used for recording consultations. This format can be used in consultations at all stages of the sub-project cycle.
Document 3	Information and Consultation Strategy (ICS)	ICS guides the implementing agency as to when and where consultations are to be conducted at different stages of a sub-project. This also captures disclosure and dissemination information.
Document 4	List of Environmentally Sensitive locations	This document lists environmentally sensitive locations (ESL). Sub-projects falling partly / wholly in any of the listed locations need to undergo detailed assessment irrespective of the categorization.
Document 5	Environmental categorization of subprojects	This document contains environmentally pre-categorized list of subproject investments that would be referred by the implementing agencies to screen and categorize the proposed subprojects under this project.
Document 6	Format for Data collection	Formats for general and sub-project specific environmental data has been provided for environmental screening and assessment (detailed / limited) of 'EA' or 'EB' sub-projects. On a case to case basis, especially for 'EA' sub-projects, additional data may also be required for detailed assessment.
Document 7	Key Environmental Standards	These are the national environmental standards for air, water and noise levels. This will be useful to compare whether the existing baseline is within the limits. It is also useful to assess and quantify that to what extent the baseline would be deviated from the standards due to the sub-project.
Document 8	Possible environmental impacts	This document provides possible environmental impacts which can help guide the ULB / consultants to assess the potential intensity of impacts on environmental parameters.
Document 9	Guidelines for Environmental Assessment	These are the common guidelines for 'EA' and 'EB' sub-projects to carry out the detailed and limited assessments. Additional exercise may need to be done for a detailed assessment on a case to case basis.
Document 10	Environmental legislations and policies	Environmental legislative framework provides the applicability of laws, policies, legislations, acts to the environmental component of sub-projects. The sub-project design, implementation, operation, assessment etc. should be within the legislative framework and conform to the appropriate legislations.
Document 11	Environmental Management Plan	Environmental management plan is the set of mitigative measures for possible environmental impacts. The purpose of this plan is to mitigate the negative adverse impacts that would be the outcome of the sub-project implementation and operation. Based on the result of assessment / status report of the sub-project, environmental management considerations at the design, implementation and operational phases need to be included in the management plan.
Document 12	Environmental Monitoring Plan	Environmental monitoring plan is to be prepared to monitor the impacts on environmental parameters during construction and operational phases. The document may be used as a reference during the preparation of monitoring measures. The document provides reference both for construction and operational phases. The frequency of monitoring (of air quality/noise levels/ground water etc.) will depend on the intensity of the impact and may vary from one subproject to the other.
Document 13	TOR guidelines for Environmental Assessment	This document provides the sample TOR for Environmental Assessment that can be included into the bid documents as tasks of assignment.
Document 14	TOR guidelines for Land Filling Operation	This document provides the sample TOR for a Land Filling Operation that can be included into the bid documents as tasks of assignment.
Document 15	Cultural Property Management Plan	This document provides guidelines for developing a management plan for effective handling of cultural properties like religious structures, archeological structures/sites, etc.
Document 16	Information on Pesticide Management	This document provides guidelines for better pesticide management by project implementing agencies.

DOCUMENT – 1

FLOW CHART OF CMAPP PROCESS



The preparation of the CMAPP under the APUSP project is a commendable step towards incorporating the participatory principles into municipal governance. The CMAPP process constitutes formation of groups namely, the Municipal Reforms Committee (MRC) which is in-charge of reform initiatives, the Municipal Task Force (MTF), which would be monitoring the investment initiatives in the town and Working Groups (WG) which would form a part of the deliberative process for identification of sub-projects and reform and social development initiatives. The committees and working groups constitute representatives of various concerned departments, members and chairman of municipal council, municipal executive staff, community representatives like the Neighbourhood Action Committee (NAC) conveners, CBOs etc.

KEY

1	Preparatory steps involve three distinct activities viz., data updation, constitution of committees and orientation workshops on CMAPP process. The ULB shall update the data relating to different aspects of municipal performance as well as implementation of proposals that would be funded under APUPMSP.
2	Three committees will be constituted in the ULB, namely the Municipal Reforms Committee (MRC), Municipal Task Force (MTF) and the Working Groups (WG). These committees constitute municipal officials, council members and representatives from community and civil society organizations working in the ULB. The MRC is in charge of identifying municipal reform initiatives, the WGs are in charge of identifying infrastructural and social development initiatives in the town and the MTF works as an implementing and appraisal body.
3	To facilitate better understanding of the CMAPP processes, funding pattern and other details an orientation workshop should be organized in the ULB. This workshop shall be supported by the APURMS Project and ensure the participation of Councilors, committee members, CBOs & SHGs and civil society organizations.
4	The review of the MAPP is undertaken by the WGs formed under the CMAPP process. In case there is no MAPP prepared for the ULB, then the ULBS have to prepare a list of proposals before the formation of the WGs for review. This exercise involves review of municipal performance in general as well as performance in the three components namely, reforms, infrastructure investments and social development. The WGs would review each proposal, analyze the progress and see whether it meets the minimum performance criteria.
5	Based on review, the WGs shall identify broad areas for reforms, infrastructure and social development and present their findings to the community in the form of meetings and consultations to facilitate discussion and also get feedback from them. This ensures community participation in identifying and appraising sub-projects.
6	Once the problem areas are discussed with the community the WGs have to rework on the proposals identified. This is critical for proper identification of proposals for CMAPP. The WGs shall also indicate the prioritized settlements to be taken up during the first cycle of CMAPP.
7	To develop authentic database on poverty and infrastructure deficiency, the ULBs shall undertake a poverty survey to collect data from the households in the sub-project locations.
8	Poverty survey shall be followed by Participatory Micro Level Planning (PMLP) for identifying the proposals to be included into the CMAPP document.
9	The WGs shall meet at least five times to articulate the proposals for incorporation in the CMAPP. The WG 1 based on review of MAPP implementation and vision of the town shall identify the reform proposals. The WG2 shall identify the on-site and off-site infrastructure proposals based on PMLP in the prioritized poor settlements. Similarly, the WG 3 shall identify the social development proposals based on PMLP. The WG 3, however, identifies the specific proposals where PMLP was conducted as well as proposals for the entire town for social development. The MTF shall support the WGs in articulating the proposals.
10	
11	
12	Second phase of community consultations would be embarked upon at this stage consisting broadly of the same members who attended the earlier orientation and review workshops. These consultations are aimed at sharing the proposals identified with the community by the WGs. Each WG presents the proposals followed by discussion and consensus building on the proposals. The participants are encouraged to make suggestions so as to incorporate them into the sub-project designs.
13	Based on the feedback and suggestions, the WGs shall finalize the proposals for reforms, infrastructure provision and social development. The MTF shall prepare a draft final report as per the guidelines and shall be discussed with the WGs and MRC. After their approval it shall be submitted to the project management unit at the APUFIDC as draft CMAPP document for appraisal.
14	After receipt of the draft CMAPP document from the project town, the APUFIDC shall undertake a pre-check to know whether the document has been formulated as per the guidelines. On satisfaction that the CMAPP draft documented has been prepared as per the processes recommended by the Project and is in accordance of the basic tenets, it shall constitute an Appraisal Team to visit the town and appraise the CMAPP proposals for funding by the APUSP.
15	If there any shortcomings identified in the field appraisal or cases where more information has to be added to the proposals, changes will be made accordingly and a revised draft final report will be prepared.
16	After the field appraisal, the town shall prepare the final document. Prior to the submission of final document it shall be placed before the Municipal Council for approval.
17	Along with the appraisal report, the final CMAPP document shall be placed before the EC for endorsement of the proposals.
18	After endorsement of the CMAPP document by the EC, the project town shall enter into a memorandum of understanding (MoU) incorporating its commitment to implement the reforms and other proposals as per the guidelines as well as adhere to time schedules with the Project.
19	Once the MoU is signed, the municipality can initiate steps to implement the proposals identified and approved in the CMAPP. The CMAPP preparation process takes about six weeks. Necessary orientation and training shall be provided by the non-official and official functionaries as well as members of poor settlements and civil society to prepare them for implementation of the sub-projects.
20	The project managers at the APUFIDC would assess the implementation of sub-projects funded and also determine the eligibility of the town/ULB for further funding.
21	The next cycle represents the identification of proposals for the preparation of a new CMAPP document for the ULB.

DOCUMENT - 2

*** FORMAT FOR RECORDING CONSULTATIONS**

District:	<input type="text"/>	Date:	<input type="text"/>
Locality:	<input type="text"/>	Time:	<input type="text"/>
Municipality:	<input type="text"/>	Venue:	<input type="text"/>
Sub-project:	<input type="text"/>	Duration:	<input type="text"/>

1. Sub-project Description

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2. Issues raised by the community and responses provided

Sl.No.	Key Social Issues Identified	Response by the Urban Local Body
1		
2		
3		
4		
5		

4. Follow up Action Required

Key Issue 1	
Key Issue 2	
Key Issue 3	
Key Issue 4	
Key Issue 5	

4. Follow up Action Taken

Key Issue 1	
Key Issue 2	
Key Issue 3	
Key Issue 4	
Key Issue 5	

* This document will be used by the ULBs while conducting consultations and discussions with the community and the PAPs at all stages of the sub-project, to record the discussions. The format given below will be useful in reviewing, planning and strengthening sub-projects by incorporating the views of the community on sub-project designs, alignments, environmental components like impacts, safeguards, etc.

DOCUMENT – 3

INFORMATION & CONSULTATION STRATEGY – ENVIRONMENT

Stages of a sub-project	Information and Consultation steps
<p>Identification and Design</p>	<p>STEP 1: proposal and feasibility (Information) A new sub project may be proposed in different ways Viz. public demand, Government's proposal, and public representatives like chairperson, M.L.A. or M.P. A specific sub project may have financial or social benefits but may have adverse environmental impacts.</p> <ul style="list-style-type: none"> • Hence it should be made mandatory to procure the information if the sub project is feasible environmentally, from primary and secondary sources. <p>The feasibility report should address the following issues</p> <ul style="list-style-type: none"> • Origin and purpose of the sub project • No sub project and with sub project situation and environmental impacts • Beneficiaries and the benefits Vs environmental impacts • Analysis of alternatives referring to the degree of benefits and impacts
<p>Identification and Design</p>	<p>STEP 2: Initial public consultation (Information) Any sub project that has been identified is to be put forth in the public consultation for their responses and reactions. This would help the ULB's in identifying the impacts from people's perception. This is also necessary to gain full public cooperation, public participation in the implementation of the sub project. Mitigation measures for the impacts generated from the public could be planned for.</p>
<p>Planning and Grounding</p>	<p>STEP – 3: Environmental Screening and assessment (Information and Consultation) At this stage, it is very important that the sub projects are screened for environmental categorization. All the sub projects that are categorized as environmentally sensitive (EA) should under go detailed / limited environmental assessment (EB), depending on the categorization. The step-by-step information and consultation required for assessment of sub projects are described as tasks below.</p> <p>Task 1: Procurement of Baseline Data (Information) The sub projects that have to go through environmental assessment should have baseline data of various parameters listed but not limited to the below mentioned. The baseline data required may be varied for different investments.</p> <p>Ambient Air Quality: Air quality data pertaining to the sub project intervention location at the initiation of the sub project is to be recorded from different locations of sub project intervention area.</p> <p>Water quality: present water quality in the lakes/ponds/rivers near by the sub project location is recorded.</p> <p>Ground water table:</p> <p>Topography: the topographical details of the sub project like location; present flooding patterns and soil conditions are to be recorded.</p> <p>Flora and Fauna: list of endangered species, trees, green cover that would be affected.</p> <p>Presence of environmentally sensitive sites/structures: Record the presence of any cultural structure, site, urban reserve forest area, and location falling under CRZ, tribal habitats in the sub-project intervention area.</p> <p>Existing Infrastructural facilities: all the Infrastructural facilities that would be affected differently by various sub projects are to be recorded.</p> <p>Task 2: Second Public Consultation (Consultation) If the sub-project environmentally sounds as per the assessment, a second consultation may be held to disclose the recommendations of the assessment report.</p>
<p>Planning and Grounding</p>	<p>STEP 4: Preparation of Environmental Management and Monitoring Plan If the sub project is passed, as per the assessment report, environmental management plan (with mitigative measures) and monitoring plan should be prepared referring to the plans annexed. This should be done for each sub-project investment, which would be part of DPR.</p>

Stages of a sub-project	Information and Consultation steps
<p>Planning and Grounding</p>	<p>STEP – 5: Detailed Sub project Report (Information) Initial consultations and the assessment report on the sub-project will pave the way for the preparation of the Detailed sub-Project Report (DPR). The detailed sub-project report will have plans, recommendations of the assessment, and various other components that are needed to implement the sub-project successfully. The DPR will constitute:</p> <ul style="list-style-type: none"> ➤ A final design of the proposed sub-project including the recommendations as per the assessment. ➤ The time frame within which the sub-project will be completed. ➤ The institutional and capacity arrangements for the implementation of the sub-project. ➤ Plan the involvement of experts, advisors and external agencies wherever necessary in the sub-project to achieve compliance with the environmental goals of the project ➤ Grievance redress mechanisms for the sub-project investment ➤ Environmental management and monitoring plans
<p>Planning and Grounding</p>	<p>STEP – 6: Preparation of Contractors BID documents (Information) Tenders that are prepared to contract the construction of the investment should also include environmental management and monitoring as additional tasks.</p> <p>Task – 3: Disclosure to public The details of the contractor, finalized for the construction of the sub-project should be disclosed to the public through newspaper advertisement and display boards at the sub-project location. This may include all the assignments devolved to the contractor with time frame.</p>
<p>Sub Project Implementation</p>	<p>STEP - 7: Intermediary Public Consultations (consultations) The number of intermediary consultations depends on the duration of the sub-project. The consultations may be done with the community task forces to assess the quality of the construction and any other critical information related with the investment. Information in connection with environmental monitoring may be procured from time to time.</p>
<p>Sub Project Implementation</p>	<p>STEP – 8: Display and Disclosure of Information (Information) The periodic progress of the sub-project investment at each stage should be displayed at the construction sites. It should consist of the following parameters</p> <ul style="list-style-type: none"> • Number of complaints received and addressed • Finance spent and progress • Estimated time for completion
<p>Sub Project Implementation</p>	<p>STEP – 9: Grievance Redress (Consultation) The ESMU (Environmental and Social Management Unit) should conduct focused Group Discussions (FGD's) during the implementation of the sub project for if there are any environmental problems that they are facing during the implementation stage. The unit should accept the complaints from the sub project affected area through phone call or in writing, and necessary action is expected in the form of additional mitigation measures, during the progress of the sub project. The mechanism given in the institutional arrangements of the SEAMF may be followed for grievance redress.</p>
<p>Monitoring and Evaluation</p>	<p>Step 10: Monitoring of Baseline Information: Periodical monitoring of change in air quality, water quality, soil erosion etc. that may occur due to sub project intervention. This is useful to take up timely measures to reduce the adverse impacts. The frequency of monitoring may be followed as given in the assessment report of the sub project.</p>
<p>Operation and maintenance</p>	<p>Step – 11: consultations for sub-project maintenance (consultation) Consultations with the public to form community task forces or maintenance wing for the sub-project operation and maintenance should be conducted for the sustainability of the sub-project investment.</p>

DOCUMENT – 4

LIST OF ENVIRONMENTALLY SENSITIVE LOCATIONS

1. Natural Habitats
2. Cultural or religious sites / structures / locations / zones / monuments
3. Heritage sites / structures / locations / zones
4. Coastal Regulation Zones / Areas
5. Urban forestry / Reserve forest areas
6. Conserved structures / lakes / rock formations
7. River beds and Tank Beds / catchments
8. Any other environmentally sensitive parameter that may fall in sub-project intervention area / impact area.

Note:

All sub-projects falling in environmentally sensitive locations will undergo a detailed environmental assessment irrespective of the categorization through scorecard. This assessment may be limited to the sensitive locations.

DOCUMENT – 5

ENVIRONMENTAL CATEGORISATION OF SUB-PROJECTS

The environmental categorization of subprojects and investments given below is based on the the feedback given by experts using Delphi technique against magnitude, scale, severity and duration of impacts that a specific investment would create when executed.

Unless otherwise stated, the below given categorization is applicable to both new and upgradation subproject investments.

However, irrespective of this categorization, any subproject investment would undergo a detailed environmental assessment, if it intervenes with the environmentally sensitive locations (Refer Document - 4)

Sub Project ID	Name of the Sub Project Investment	Environmental categorization
SUBPROJECT: WATER SUPPLY		
WS 1	Water Distribution	EC
WS 2	Water mains	EC
WS 3	Water Pumping Stations	EB
WS 4	Water Treatment Plants	EB
WS 5	Source development (new)	EA
WS 6	Source development (up gradation)	EB
WS 7	Water Tankers	EC
WS 8	Water OHT	EC
WS 9	Water UGT	EC
WS10	Unaccounted for Water / leakage detection	EC
WS11	Software installation for water supply / treatment	EC
WS12	Operation & Maintenance of Water Supply System	EC
SUBPROJECT: SEWERAGE		
SE 1	Secondary Sewers	EC
SE 2	Main Trunk sewers (new)	EB
SE 3	Main Trunk sewers	EC
SE 4	Sewage Pumping Stations	EB
SE 5	Sewage Treatment Plants (new)	EA
SE 6	Sewage Treatment Plants (up gradation)	EB
SE 7	Pay & Use Toilets	EC
SE 8	Community Toilets (new)	EB
SE 9	Community Toilets (up gradation)	EC
SE10	Septic Tanks/Soak Pits (new)	EB

SE11	Septic Tanks/Soak Pits (up gradation)	EC
SE12	Procurement of distilling/jetting and other equipment	EC
SE13	Recycling & Reuse of Sewage (new)	EA
SE13	Recycling & Reuse of Sewage (up gradation)	EB
SE14	Operation & Maintenance of sewage systems	EC
SUBPROJECT: STORM WATER DRAINAGE		
SW 1	Drainage Lines	EB
SW 2	Interception and Diversion Works	EC
SW 3	Interception Chambers/ Outfall Chambers	EB
SW 4	Procurement of distilling/jetting and other equipment	EC
SW 5	Percolation & Recharging System	EC
SW 6	Operation & Maintenance of storm water systems	EC
SUBPROJECT: SOLID WASTE MANAGEMENT		
SWM 1	Primary Collection Systems – Tools & Equipment	EC
SWM 2	Secondary Storage	EC
SWM 4	Transportation - Procurement of Trucks, Trailers	EC
SWM 5	Processing of Waste – landfill, composting, power generation through pelletisation of waste, etc.	EA
SWM 6	Repairs & Maintenance of Equipment/Civil Material	EC
SWM 7	Operation & Maintenance of solid waste processing	EB
SUBPROJECT: ROADS AND TRANSPORTATION NETWORK		
Roads		
RN 1	New Roads	EB
RN 2	Widening Of Roads	EB
RN 3	Traffic Islands	EC
RN 4	Road Medians	EC
RN 5	Foot paths	EC
RN 6	Improvement of Surface	EC
Street Furniture		
RN 7	Signals	EC
RN 8	Street Lights	EC
RN 9	Sign Boards	EC
Road Structure		
RN 10	Sub ways (new)	EB
RN 11	Sub ways (up gradation)	EC

RN 12	Pedestrian	EC
RN 13	Cycle tracks	EC
RN 14	RUB/ROB	EC
RN 15	Culverts and Small Bridges (new)	EB
RN 16	Culverts and Small Bridges (up gradation)	EC
RN 17	Service Ducts	EC
Terminals/Shelter		
RN 18	Bus Shelter	EC
RN 19	Bus terminals/Stand	EC
RN 20	Truck Terminals (up to 50 trucks)	EC
RN 21	Truck Terminals (provision for more than 50 trucks)	EB
RN 22	Workshops / Depots	EB
RN 23	Parking	EC
SUBPROJECT: SLUM UPGRADATION		
SL 1	Provision of Physical & Social Infrastructure (In site up gradation without displacement)	EB
SL 2	Relocation of Slums	EB
SUBPROJECT: COMMUNITY FACILITIES		
CF 1	Hospitals with less than 20 beds	EC
CF 2	Hospitals with 20 beds or more	EB
CF 3	Schools	EC
CF 4	Crematorium (cultural property)	EA
CF 5	Reading Rooms/ Libraries	EC
CF 6	Parks and Play Grounds	EC
CF 7	Ambulances	EC
CF 8	Marriage Halls/Community halls	EC
SUBPROJECT: FIRE FIGHTING AND DISASTER MANAGEMENT SYSTEMS		
FF 1	Fire Tenders and Other Equipment	EC
FF 2	Rescue and Relief Equipment during Disasters	EC
SUBPROJECT: MUNICIPAL ASSETS (Complexes & Markets)		
MA 1	Shopping/Office Complexes (up to 20,000 sq.m. built up area / up to five floors)	EC
MA 2	Shopping/Office Complexes (above 20,000 sq.m. built up area / above five floors)	EB

MA 3	Vegetable/Fish Markets (up to 20 shops / shutters)	EC
MA 4	Vegetable/Fish Markets (above 20 shops / shutters)	EB
MA 5	Slaughter Houses	EA
SUBPROJECT: INTEGRATED AREA DEVELOPMENT		
AD 1	Large Scale Housing Projects (number of units between 100 to 500)	EB
AD 2	Large Scale Housing Projects (number of units above 500)	EA
SUBPROJECT: ENVIRONMENT IMPROVEMENT		
EI 1	Lake / Pond Development	EB
EI 2	River Front Development	EA
EI 3	Urban Forestry / Green Belt	EC
EI 4	Recharging of Old Tanks / Wells	EC
EI 5	Recharging of Percolation System	EC
EI 6	Rain Water Harvesting	EC
EI 7	River Cleaning / Dredging	EB
SUBPROJECT: HERITAGE CONSERVATION AND TOURISM DEVELOPMENT		
HC 1	Theme Park	EC
HC 2	Craft Center	EC
HC 3	Tourism Information Center	EC
HC 4	Basic Facilities at Tourism Sites	EC
HC 5	Heritage Conservation	EC
HC 6	Tourism Development	EA
HC 7	Architectural Heritage	EC
SUBPROJECT: ENVIRONMENTAL MONITORING		
EMP 1	Procurement of Equipment for Air, Water, Noise monitoring	EC
EMP 2	Installation of Monitoring Station	EC
SUBPROJECT: INFORMATION SYSTEMS MANAGEMENT		
IS 1	Remote Sensing & GIS Laboratory	EC
IS 2	Procurement of Hardware & Software Equipment	EC

DOCUMENT - 6

FORMAT FOR ENVIRONMENTAL DATA COLLECTION

The formats of data requirements / guidelines for the assessment of subprojects that would be proposed under the project APURMSP are given below. These shall be used for all those subproject investments that fall in the categories “EA” or “EB”, as per the categorization list provided with this manual. However, the format provided here pertains to the minimum data requirements and does not include the comprehensive list that will depend on the size, type, duration, local conditions of the subproject.

Apart from the given data requirements, All the subproject investments, irrespective of the categorization should include in their design and proposal, the additional space for increasing population in future, to absorb the increasing demand for extending particular service.

1. AIR

1.1 Ambient air quality levels in the sub-project location/locations

Peak hours Timings:

Sampling Stn. Location	NO _x	SO ₂	CO	RSPM	SPM	Noise levels

Non-Peak hours Timings:

Sampling Stn. Location	NO _x	SO ₂	CO	RSPM	SPM	Noise levels

2. WATER

2.1 Existing Ground water quality

Samples (location)	DO	BOD	COD	pH	Total coliform	TDS	Pb	Fl	Cl

2.2 Existing surface water quality

Samples (location)	DO	BOD	COD	pH	Total coliform	TDS	Pb	Fl	Cl

3. LAND

3.1 Topography

- Contour map of the sub-project area / location.
- Topography Map of the town highlighting sub-project location.

3.2 Soil Condition

Type of soil	Area	From-to	Bearing capacity	Porosity	Remarks

3.3 Details of environmentally sensitive areas/sites/structures in sub-project intervention area¹

<i>Name of the Resource</i>	<i>Importance</i>	<i>Protection status</i>	<i>Area of Intervention</i>	<i>Description</i>

(Refer document 6 for list of environmentally sensitive Locations)

¹ Sub-Project intervention area is the area of sub-project construction/operation + area used during construction/operation + immediate vicinity of the sub-project construction area.

3.4 Disturbance to Other Civic Services

<i>Type of Amenity</i>	<i>Y/N</i>	<i>Brief description</i> <i>(Reference Map of Sub-Project Intervention Area, with all the amenities to be annexed)</i>
<i>Water supply distribution lines</i>		
<i>Sewerage lines</i>		
<i>Sanitation</i>		
<i>Solid Waste Management</i>		
<i>Traffic and Transportation</i>		
<i>Street Lighting</i>		
<i>Electric Power Distribution lines</i>		
<i>Others (Specify)</i>		
Note: Map to be attached		

3.5 Land Use Pattern of the Sub Project Intervention Area

Type of land use	Area / length (sq.mts/mts)	Percentage of sub-Project area	Brief Description

3.6 List of Major Industries / Institutions Present In the Sub-Project Intervention Area

Name of the Industry/ institution	Activity / product manufactured	Number of employees	Remarks / any environmentally sensitive issues w.r.t. the industry / institution

4. ECOLOGY

4.1 Flora and Fauna

Total number of floral species present in the sub project intervention area²

Name of the species	Habitat cover	Density	Protection status

Note: Habitat reference map to be annexed for the sub project intervention area

Total number of faunal species present in the sub project intervention area

Name of the species	Habitat cover	Density	Protection status

Note: Habitat reference map to be annexed for the sub project intervention area

Total number of trees that would be destroyed due to sub-project intervention area

Name of the species									
Number of trees									

Note : Drawings with the following details earmarked should be procured

- a. Topographical / Contour details
- b. Existing water/sewerage lines within the sub-project proposed area
- c. Storm water drains / canals/ water bodies / trees falling in the sub-project area, if any
- d. Building structures, environmentally sensitive areas intervening with the sub-project proposal

5. ENVIRONMENTAL DATA REQUIREMENTS – SUB PROJECT SPECIFIC

² **Guidelines for Identifying Sub-Project Intervention area**

- Actual sub-project area including the area used during construction / operation falls in sub-project intervention area
- Area abutting (vicinity) sub-project area and/ or area used during construction/operation includes in intervention area
- Area used during construction/operation includes area for material dumping, temporary alternative alignment etc.

5.1 SUB-PROJECT: WATER SUPPLY

Details of Proposed Water Supply (brief description)	
Name of the sub-project investment	
Source of Water supply (Name and Type of source)	
Ground water table at the source (if the source is ground water)	
Distance of source from the target area, final point (in Meters)	
Details of Water Treatment Plant, if any?	
Arrangements for environmental monitoring of the water quality at different stages of supply, operations of water treatment plant, etc. like laboratory, control room and others.	
Design considerations to provide water for future additional demand due to increase in population / households /, etc.	
Remarks (condition of the existing system, other than the proposed.)	

5.1.1 Water Quality at the Source (proposed source)

Samples	DO	BOD	COD	pH	Total coliform	TDS	Pb	Fl	Cl

Details of Existing Water Supply (Brief Description)	
Demand of water supply (in Liters)	
Quantity of current supply	
Source of current supply	
Current deficiency	
Description of water treatment status	
Existing sewage facility of the beneficiary households	
Present volume of sewage generated per day, from the beneficiaries' households.	
Mode of disposal of sewage? Drain / open flooding	
Brief the Condition of the sewerage drain	
If the beneficiaries have a sewerage connection, its maximum volume	
Expected volume of sewage per day due to increase in water supply	
Is the present sewage system (if any) designed for additional sewage that would be let out due to additional water supply? If no, measures taken?	

5.2 SUB-PROJECT: SOLID WASTE MANAGEMENT

Parameter	Description
Total quantity of solid waste produced per day	
Present quantity collected per day	
Current solid waste situation	
Waste Processing	
Mode and means of transportation	
Proposed solid waste management	
Availability of land for solid waste management	
<u>For Landfill projects</u>	
Distance of the proposed landfill	
Maximum capacity (volume) of the proposed landfill	
Topography of the Landfill	
Ground water table at the Landfill	
Porosity of the soil in the landfill	
Distance of the nearest housing / settlements / hospitals etc. from the proposed landfill	
Proposed collection and dumping system from source till landfill with details of transportation mechanism and machinery used (covered / uncovered)	

5.3 SUB-PROJECT: SEWERAGE

Parameter	Description
Name of the sub-project investment	
Present sewage disposal point of the beneficiary households (if any)	
Details of sewerage treatment plant, proposed/existing.	
Total quantity of sewage generated produced	
Total volume/carryng capacity of the proposed sewage disposal	
details of disposal point/fall out point (barren land/agricultural land/water body)	
Details of water bodies at the disposal point, if any (water quality, still or running water/ usage etc.)	
If the disposal point is not a water body, ground water table and soil characteristics of the fallout location)	
Gradient from source(beneficiaries) to disposal	
Name the pollutants let into the sewage, from source till disposal point.	
Provision for overflow of drainage / sewage	
Arrangements for environmental monitoring of the operations and treated sewage like laboratory, control room etc.	
Design considerations to absorb future additional volume of sewage due to increase in population/households/ increased water facility, etc.	

Note: Proposed Sewage Network (Network drawings to be annexed)

5.3.1 Details of pollutant load let into sewerage

Type of waste/pollutants	Quantity/ day	Presence of any hazardous material	Source of waste	Remarks

5.4 SUB-PROJECT: STORM WATER DRAINS

Parameter	Description
Name of the sub-project investment	
Present storm water disposal point (if any)	
History of flooding in the past and Area of inundation (drawings to be annexed)	
Catchments of the proposed storm water drain (Area in Acres/SQ.M. – drawings to be annexed)	
Total volume/carrying capacity of the proposed storm water drain	
details of disposal point/fall out point (barren land/agricultural land/water body)	
Details of water bodies at the disposal point, if any (water quality, still or running water/ usage etc.)	
If the disposal point is not a water body, ground water table and soil characteristics at the fallout location)	
Gradient of the drain till disposal	
Name the solid and liquid pollutants let into the drain, other than storm water (Domestic solid waste, Sewage disposal, Industrial effluents)	

Note: Storm water drain network drawings to be annexed, highlighting the catchment area and area of inundation during flooding.

5.4.1 Details of pollutant load let into water bodies

Type of waste/pollutants	Quantity/ day	Presence of any hazardous material	Source of waste	Remarks

5.4.2 Water quality of the drain

Samples	DO	BOD	COD	pH	Total coliform	TDS	Pb	Fl	Cl

5.5 SUB-PROJECT: ROADS

5.5.1 Existing Surface finish of the sub-project location

Surface Finish	Condition (Good, moderate, Bad, Worst)	From – to	Length in Meters
Earth			
B.T.			
W.B.M.			
C.C.			

5.5.2 Sub-project specifications (existing vs. proposed)

	Carriage way	Right of way	Median	Remarks
Existing				
Proposed				

5.6 SUB-PROJECT: COMMUNITY FACILITIES

5.6.1. Crematorium

Parameter	Description
Location of the crematorium – within the town or in the outskirts of the town.	
Whether the proposal includes a high rise compound wall?	
Distance of the nearest human activity locations belonging to all the religious communities other than the community to which the crematorium belongs to.	
Distance of the nearest temple, mosque, church / human settlement / educational institution or any human activity likely to have impact due to the proposed crematorium.	
Population percentage of the religious community to which the crematorium belongs to.	
List out the critical issues / objections / suggestions etc. from the public consultations conducted in the surroundings of the proposal and from the town wide consultations.	
<i>Note: Involvement of communities, NGOs, CBOs is crucial in the decision making and assessment of crematorium proposal. Hence maximum number of consultations should be conducted to build consensus of all sections of the society.</i>	

5.6.2 Hospitals

Hospitals of medium and large scale that are likely to generate bio medical wastes should be assessed at the design stage, for their operational mechanism of bio-medical waste so that it does not have any adverse impact on human health or environment. Below is the check list guide for environmental assessment of the operations of the hospital.

- Ensure safe location of the operation theatres in the sterilized zones.
- Standard mechanism and sufficient finances for proper maintenance of sterilized zones as per appropriate medical standards should be verified.
- The architectural design of the hospital and the operational mechanism of the bio medical waste shall be designed in such a way that they conform to the safe collection, storage, segregation, transportation and treatment of the waste as per “the Bio-Medical Waste (Management and Handling) Rules, 1998”. Some of them are detailed below:
 - Strict mechanism to adhere to the rule that Bio-medical waste shall not be mixed with other wastes.
 - Ensure that no untreated bio-medical waste shall be kept stored beyond a period of 48 hours.
 - Arrangements shall be assessed for the incineration / deep burial of all organic wastes, tissues, animal wastes.
 - Assessment for the autoclaving / incineration of Microbiology & Biotechnology Wastes like waste from laboratory cultures, specimens of micro- organisms live or attenuated vaccines , human and animal cell culture used in research, etc. shall be done.
 - Provision for chemical treatment / autoclaving to disinfect Waste sharps, Discarded Medicines and Cytotoxic drugs, Solid Waste, Liquid Waste,etc. shall be verified.
 - Necessary arrangements to put in practice, the bio-medical waste rules 1998 for treatment, transport and disposal of waste.

5.7 SUB-PROJECT: SLAUGHTER HOUSES

Parameter	Description
Location of the slaughter house – within the town or in the outskirts of the town.	
Whether the proposal slaughter house design is high rise, away from settlements, with proper facilities for treatment and disposal of wastes?	
Distance of the nearest temple, mosque, church / human settlement / educational institution or any human activity likely to have impact due to the proposed slaughter house.	
List out the critical issues / objections / suggestions etc. from the public consultations conducted in the surroundings of the proposal and from the town wide consultations.	
Note: Involvement of communities, NGOs, CBOs is crucial in the decision making and assessment of slaughter house proposal. Hence maximum number of consultations should be conducted to build consensus of all sections of the society.	

The location, the architectural design specifications and waste disposal of the slaughter house should be in accordance with 'The Prevention of Cruelty to Animals (Slaughter House) Rules, 2001' by Ministry of Environment. Some of them are given below for assessment:

- The slaughter house shall have a reception area of adequate size sufficient for livestock subject to veterinary inspection.
- The reception area of slaughter house shall have proper ramps for direct unloading of animals from vehicles or railway wagons and the said reception area shall have adequate facility sufficient for feeding and watering of animals.
- Separate isolation pens shall be provided in slaughter house with watering and feeding arrangements for animals suspected to be suffering from contagious and infectious diseases, and fractious animals, in order to segregate them from the remaining animals.
- Adequate holding area shall be provided in slaughter house according to the class of animals to be slaughtered and the said holding area shall have water and feeding facilities.
- The resting grounds in slaughter house shall have overhead protective shelters.
- Ante-mortem and pen area in slaughter house shall be paved with impervious material such as concrete non-slippery herring-bone type suitable to stand wear and tear by hooves, or brick, and pitched to suitable drainage facilities and the curbs of said impervious material 150 to 300 mm high shall be provided around the borders of livestock pen area, except at the entrances and such pen shall preferably be covered.
- The space provided in the pens of such lairage shall be not less than 2.8 sq.mt. per large animal and 1.6 sq.mt. per small animal.
- The slaughter halls in a slaughter house shall provide separate sections of adequate dimensions sufficient for slaughter of individual animals to ensure that the animal to be slaughtered is not within the sight of other animals.
- Every slaughter house as soon as possible shall provide a separate space for stunning of animals prior to slaughter, bleeding and dressing of the carcasses

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KEY ENVIRONMENTAL STANDARDS

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)					
Pollutants	Time-weighted average	Concentration in ambient air			Method of measurement
		Industrial areas	Residential, rural & other areas	Sensitive areas	
SulphurDioxide (SO ₂)	Annual Average*	80 µg/m ³	60 µg/m ³	15 µg/m ³	- Improved West and Geake Method - Ultraviolet Fluorescence
	24 hours**	120 µg/m ³	80 µg/m ³	30 µg/m ³	
Oxides of Nitrogen (NO _x)	Annual Average*	80 µg/m ³	60 µg/m ³	15 µg/m ³	- Jacob & Hochheiser Modified (Na-Arsenite) Method - Gas Phase Chemiluminescence
	24 hours**	120 µg/m ³	80 µg/m ³	30 µg/m ³	
Suspended Particulate Matter (SPM)	Annual Average*	360 µg/m ³	140 µg/m ³	70 µg/m ³	- High Volume Sampling, (Average flow rate not less than 1.1 m ³ /minute).
	24 hours**	500 µg/m ³	200 µg/m ³	100 µg/m ³	
RespirableParticulate Matter (RPM) (size less than 10 microns)	Annual Average*	120 µg/m ³	60 µg/m ³	50 µg/m ³	- Respirable particulate matter sampler
	24 hours**	150 µg/m ³	100 µg/m ³	75 µg/m ³	
Lead (Pb)	Annual Average*	1.0 µg/m ³	0.75 µg/m ³	0.50 µg/m ³	- ASS Method after sampling using EPM 2000 or equivalent Filter paper.
	24 hours**	1.5 µg/m ³	1.00 µg/m ³	0.75 µg/m ³	
Ammonial	Annual Average*	0.1 mg/ m ³	0.1 mg/ m ³	0.1 mg/m ³	
	24 hours**	0.4 mg/ m ³	0.4 mg/m ³	0.4 mg/m ³	
CarbonMonoxide (CO)	8 hours**	5.0 mg/m ³	2.0 mg/m ³	1.0 mg/ m ³	- Non Dispersive Infra Red (NDIR) Spectroscopy
	1 hour	10.0 mg/m ³	4.0 mg/m ³	2.0 mg/m ³	
*	Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.				
**	24 hourly/8 hourly values should be met 98% of the time in a year. However, 2% of the time, it may exceed but not on two consecutive days.				
<ol style="list-style-type: none"> 1. National Ambient Air Quality Standard: The levels of air quality with an adequate margin of safety, to protect the public health, vegetation and property. 2. Whenever and wherever two consecutive values exceed the limit specified above for the respective category, it would be considered adequate reason to institute regular/continuous monitoring and further investigations. 					
Source : http://www.cpcb.delhi.nic.in/as.htm					

AMBIENT AIR QUALITY STANDARDS IN RESPECT OF NOISE			
Area Code	Category of Area	Limits in dB (A) Leq	
		Day Time	Night Times
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note :

- Day time is reckoned in between 6.00 AM and 9.00 PM
- Night time is reckoned in between 9.00 PM and 6.00 AM
- Silence zone is defined as areas up to 100 meters around such premises as hospitals, educational institutions and courts. The Silence zones are to be declared by the Competent Authority.

Use of vehicular horns, loudspeakers and bursting of crackers shall be banned in these zones.

- Mixed categories of areas should be declared as one of the four above mentioned categories by the Competent Authority and the corresponding standards shall apply.

Source : <http://dpcc.delhigovt.nic.in/noisestd.htm>

WATER QUALITY STANDARDS

PRIMARY WATER QUALITY CRITERIA FOR DESIGNATED BEST USE PRACTICE		
Designated-best-use	Class of water	Criteria
Drinking water source without conventional treatment but after disinfection	A	<ul style="list-style-type: none"> ➤ 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 20oc 2mg/l or less
Outdoor bathing (organized)	B	<ul style="list-style-type: none"> ➤ 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 20oc 3mg/l or less
Drinking water source after conventional treatment and Disinfection	C	<ul style="list-style-type: none"> ➤ 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 20oc 3mg/l or less
Propagation of wild life and fisheries	D	<ul style="list-style-type: none"> ➤ 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	<ul style="list-style-type: none"> ➤ 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 : <http://www.cpcb.delhi.nic.in/classi.htm>

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POSSIBLE ENVIRONMENTAL IMPACTS

The matrix given below highlights the possible adverse environmental impacts due to different sub-projects. It is advised that the project implementing agency / consultants use this as an input while trying to assess the adverse environmental impacts of different sub-projects. However, the impacts indicated below are suggestive – the nature and severity of impacts will also depend on the environmental baseline and the location/topography of the sub-project area.

POSSIBLE ENVIRONMENTAL IMPACTS				
SUB-PROJECT	AIR	WATER	LAND	FLORA & FAUNA
Solid waste management	A1: Increase in nitrogenous, sulphur dioxide gasses, suspended particulate matter etc. in the air will degrade the air quality. Increase in air pollution due to transport of solid waste.	W1: Contamination of ground water due to leaching from waste and rain water seepage from solid waste site. The impact may be severe in coastal areas where the water table is high.	L1: Has high potential to cause change in land use and loss of productive land.	F1: Felling of trees could have high impact on the immediate environment.
	A2: Nuisance due to odour and flies/insects from dump sites. Odour nuisance due to uncovered transportation of solid waste.	W2: presence of surface water bodies like lakes/ponds/rivers nearby dumping sites may have high negative impact on surface water bodies.	L2: if the contour/topography of the proposed site is at a low level, chance of inundation is high. This will degrade the land environment to a considerable level.	F2: Loss of any endangered plant /animal species will also mark impact as high.
	A3: transportation of solid waste to dumping site will increase the noise levels, to some extent.			
storm water drains	A1: if the existing air quality baseline is not within in the standards, it may cause adverse impacts on air quality during construction.	W1: ground water contamination may be there during construction and operation, if the concrete lining is not done. Chances for ground water contamination taking into account the disposal point/location of the drain.	L1: the proposal for a new storm water drain may have adverse impacts on land use, along its alignment.	F1: Felling of trees could have high impact on the immediate environment.
	A2: degraded water quality in the storm water drains will increase odour nuisance to considerable extent, during construction.	W2: if the disposal of the drain is into lakes/ponds/rivers etc., surface water is contaminated. Chances for overflowing/flooding of the drain also cause surface water contamination to a considerable extent. Contamination of drinking water during construction/operation due to leakage at junction points.		
	A3 : construction machinery may increase noise levels to some extent.			
Water supply	A1: air pollution in water supply distribution	W1: change in ground water levels/quality	L1: water logging due to leakages and overflows	F1: Felling of trees could

	system is minimal.	due to over exploitation will have high impact (where the source is bore wells)	may have considerable impact on land use.	have high impact on the immediate environment.
	A2: odour nuisance in water supply projects is minimal.	W2: water logging due to leakages and overflows may impact surface water.	L2: water logging due to leakages and overflows during operation, disturbance to other services may cause inundation/flooding during construction	F2: Loss of any endangered plant /animal species will also mark impact as high.
	A3: noise pollution is high during construction of water projects, especially water treatment plants (long duration with high intensity)	Disturbance to other services (sewer lines/ drains etc.) may have high impact on surface water.		
Roads	A1: laying of roads/bridges/flyovers will increase the dust particles in the air that will degrade its quality during construction. Vehicular pollution will increase oxides of nitrogen, sulphur and carbon.	W1: impact on ground water due to construction/operation of road projects is minimal, unless there is exploitation of ground water for construction.	L1: Has high potential to cause change in land use and loss of productive land, especially when land acquisition is involved.	F1: Felling of trees could have high impact on the immediate environment.
	A2: odour nuisance due to increased levels of carbon and other poisonous gasses, during operation.	W2: impact on surface water bodies may be there due to change in the topography / flooding patterns due to a road project.	L2: Changed topography and land use can result in flooding/ inundation of low lying areas during rains.	F2: Loss of any endangered plant /animal species will also mark impact as high.
	A3: vehicular density during operation is directly proportional to the increased noise levels.			
Sewerage	A1: if the existing air quality baseline is not within the standards, it may cause adverse impacts on air quality during construction and operation. The impact is minimal if the proposal is underground drainage. A sewerage treatment plant will have severe impact on air quality.	W1: ground water contamination will result during construction and operation, if concrete lining is not done. Chances for ground water contamination taking into account the disposal point/location of the drain.	L1: the proposal for a new sewerage line may have adverse impacts on the land use, along its alignment.	F1: Felling of trees could have high impact on the immediate environment.
	A2: odour nuisance during operational phase, if the proposal is not an underground sewerage. Sewerage treatment plant will have severe odour impacts.	W2: if the disposal of the sewage is in to the lakes/ponds/rivers etc., surface water is contaminated and the impact is high. Chances for overflowing / flooding of the sewage also cause surface water contamination to a considerable extent. Possibility of contamination of drinking water during construction/operation due to leaking at the junction points. The effluents from STPs will have severe impacts on surface water.	L2: Flooding / inundation due to the topography/slope/contour etc. may have adverse impacts on land environment.	F2: Loss of any endangered plant /animal species will also mark impact as high.
	A3: construction machinery may increase noise levels to some extent. STPs at operational phase will result in high noise pollution.			

A1 – Ambient air quality

A2 – Odour nuisance in air environment

A3 – Noise levels

W1– Ground Water

W2 – Surface Water

L1 – Change in land use

L2 – Flooding of land

F1 – Felling of trees

F2 – Flora and Fauna

DOCUMENT – 9

GUIDELINES FOR ENVIRONMENTAL ASSESSMENT OF SUB PROJECTS

1. All the 'EA' categorized sub-projects must and should undergo the "Detailed Environmental Assessment" as per the below mentioned guidelines.
2. If the sub-project is categorized as 'EA' because it intervenes an environmentally sensitive location/site/structure, the assessment may be limited to that area (sensitive location).

ENVIRONMENTAL BASELINE DATA

3. Environmental baseline data of the proposed sub-project intervention area to be collected. The format for data collection may be referred for procuring the baseline information.
4. Environmental baseline information needs to be collected for areas falling outside the sub-project intervention area if they are likely to face adverse environmental impacts due to the sub-project intervention.
5. As part of the data collection, required maps (topographical / contour / infrastructure service lines / habitat cover of flora and fauna / environmental sensitive locations etc.) that may likely to be affected due to sub-project intervention should be prepared for detailed assessment.
6. Public consultations in the sub-project intervention area with key stakeholders should be used to highlight the problems faced and likely impacts due to the sub-project intervention.
7. The data should also consist of
 - The size of the sub-project in terms of budget, area, estimated time of completion
 - The location of the sub-project and its intervention with environmentally sensitive locations
 - Number of beneficiaries and affected persons / families
 - Present infrastructure facilities like water distribution, sewage, storm water drains, street lights etc. and their maximum carrying capacities (quantity / volume) that would be affected due to sub-project intervention.

REFER TO ENVIRONMENTAL LEGISLATIONS AND POLICIES

8. The Environmental Legislations and Policies may be referred to assess compatibility with the environmental legislative and policy framework. For example, intervention of sub-project alignment with the coastal regulation area is within the framework of CRZ regulations of 1991.

IDENTIFYING THE ADVERSE IMPACTS

9. Impacts can be identified by comparing the existing baseline and various components of the proposed sub-project like alignment, size, disturbance to existing civic services etc.
10. Overlay the forecasted adverse impacts due to the proposed sub-project on the existing baseline. A graph with environmental parameters on X-axis and existing and forecasted impacts on the Y-axis is suggested. This will bring to light quantitatively and qualitatively, the intensity and area of impact.
11. In addition, Public consultations may inform the implementing agency, whether all the impacts have been accounted for, as well as provide a bottom-up perspective on environmental hazards and management.

ANALYSIS OF ALTERNATIVES

12. All the available alternatives (including the proposed alternative) for the alignments / locations / technology with respect to environmental impacts may be identified and analyzed to address the potential negative impacts. No project alternative (what would be the scenario of existing environmental baseline, projected in to future, if the project is not taken up) should also be analyzed.

SUGGESTIVE / MITIGATIVE MEASURES

13. Refer to 'Environmental Management Plan and Monitoring Plan' to identify the suggestive measures / mitigative measures for the impacts identified.
14. Finalise the measures to be taken for reducing/mitigating the adverse impacts on air, water, land, flora & fauna. Ensure that the measures proposed pertain not only to the period of implementation of the sub-project but also for subsequent operation & maintenance phase.

DETAILED PROJECT REPORT (DPR)

15. The Detailed Project Report that is prepared for every sub-project for approval from APUFIDC and PCB should include separate environmental management and monitoring plans for the sub-project if the sub-project is categorized as 'EA' or 'EB'.

DOCUMENT – 10

ENVIRONMENTAL LEGISLATIONS AND POLICIES

Sub-Project	Sub-Project investment	Applicability of Environmental Laws and Policies	Remarks
Water	<ul style="list-style-type: none"> • Water Distribution • Water mains • Water Pumping Station • Water Treatment Plants • Source development • Water OHT • Water UGT • Un accounted for water (Leak detection projects) 	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment
		Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Applicable to all activities, which discharge effluents as a result of process or operations.
		Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 & 1988	
		Forest (Conservation) Act, 1980 – as amended in 1988	Applicable if the project involves any activities in the reserved forests, village forests, protected forests and other areas as declared by the state government.
		Wildlife Protection Act, 1972	The act prohibits picking, uprooting, damaging, destroying, acquiring any specified plant from any forest land It bans the use of injurious substances, chemicals, explosives that may cause injury or endanger any wildlife.
		Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.
		The Hazardous Wastes (Management And Handling) Rules, 1989	Materials such as heavy metals, toxic inorganic, oils, emulsions, spent chemicals and Metal-finishing wastes emanating during construction and operation should be stored and disposed of as per the Rules.
		Andhra Pradesh Water, Land and Tree Act, 2002	Applicable for protection of natural water resources in Urban areas and specifically regulate the exploitation of ground and surface water sources
	Andhra Pradesh Infrastructure Development Enabling Act, 2001	Applicable to all urban infrastructure projects involving private sector involvement in the development, finance, construction and operation and maintenance phases	
	<ul style="list-style-type: none"> • Purchase of water tankers • Purchasing of soft ware 	Not applicable	————
Sewerage	<ul style="list-style-type: none"> • Secondary Sewers • Main Trunk sewers • Sewage Pumping Stations • Sewage Treatment Plants • Pay & Use Toilets • Community Toilets • Septic Tanks/Soak Pits • Recycling & Reuse of Sewage 	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment
		Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Applicable to all activities, which discharge effluents as a result of process or operations.
		Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 & 1988	
		Forest (Conservation) Act, 1980 – as amended in 1988	Applicable if the project involves any activities in the reserved forests, village forests, protected forests and other areas as declared by the state government.

Sub-Project	Sub-Project investment	Applicability of Environmental Laws and Policies	Remarks
Sewerage		Wildlife Protection Act, 1972	The act prohibits picking, uprooting, damaging, destroying, acquiring any specified plant from any forest land It bans the use of injurious substances, chemicals, explosives that may cause injury or endanger any wildlife.
		Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.
		The Hazardous Wastes (Management And Handling) Rules, 1989	Materials such as sludge, heavy metals, toxic inorganic, oils, emulsions, spent chemicals and Metal-finishing wastes emanating during construction and operation should be stored and disposed of as per the Rules.
	<ul style="list-style-type: none"> • Sewage Treatment Plants • Recycling & Reuse of Sewage 	Air Act, 1987	Obnoxious gases either from the process or from the equipment should not be emitted leading to degradation in air quality
		Andhra Pradesh Infrastructure Development Enabling Act, 2001	Applicable to all urban infrastructure projects involving private sector involvement in the development, finance, construction and operation and maintenance phases
Storm Water Drainage	<ul style="list-style-type: none"> • Drainage Lines • Interception and Diversion Works • Interception Chambers/ Outfall Chambers • Percolation & Recharging System 	The Environment (Protection) Act, 1986 Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Any act during implementation causing damage to environment Applicable to all activities which discharge effluents as a result of process or operations
		Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 & 1988	
		Forest (Conservation) Act, 1980 – as amended in 1988	Applicable if the project involves any activities in the reserved forests, village forests, protected forests and other areas as declared by the state government.
		Wildlife Protection Act, 1972	The act prohibits picking, uprooting, damaging, destroying, acquiring any specified plant from any forest land It bans the use of injurious substances, chemicals, explosives that may cause injury or endanger any wildlife.
		Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.
		Andhra Pradesh Infrastructure Development Enabling Act, 2001	Applicable to all urban infrastructure projects involving private sector involvement in the development, finance, construction and operation and maintenance phases
Solid Waste Management	<ul style="list-style-type: none"> • Primary Collection Systems – Tools & Equipment • Secondary Storage 	The Environment (Protection) Act, 1986 Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Any act during implementation causing damage to environment Applicable to all activities, which discharge effluents as a result of process or operations.
		Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 & 1988	
		Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.
		Andhra Pradesh Infrastructure Development Enabling Act, 2001	Applicable to all urban infrastructure projects involving private sector involvement in the development, finance, construction and operation and maintenance phases

Sub-Project	Sub-Project investment	Applicability of Environmental Laws and Policies	Remarks
	<ul style="list-style-type: none"> Processing of Waste and Disposal 	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment Environmental Clearance to be mandatorily obtained for location of Landfill sites
		EIA Notification, 1994	
		Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Applicable to all activities, which discharge effluents as a result of process or operations.
		Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 & 1988	
		Forest (Conservation) Act, 1980 – as amended in 1988	Applicable if the project involves any activities in the reserved forests, village forests, protected forests and other areas as declared by the state government.
		Wildlife Protection Act, 1972	The act prohibits picking, uprooting, damaging, destroying, acquiring any specified plant from any forest land It bans the use of injurious substances, chemicals, explosives that may cause injury or endanger any wildlife.
		Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.
		The Hazardous Wastes (Management And Handling) Rules, 1989	Materials such as sludge, heavy metals, toxic inorganic, oils, emulsions, spent chemicals and Metal-finishing wastes emanating during construction and operation should be stored and disposed of as per the Rules.
	Air Act, 1987	Obnoxious gases either from the process or from the equipment should not be emitted leading to degradation in air quality	
	Transportation - Procurement of Trucks, Trailers	Not applicable	_____
All projects	Solid waste management Rules and bio-medical wastes rules	Applicable to all projects in implementation of solid waste management.	
Roads and Transportation <ul style="list-style-type: none"> New Roads Foot paths Sub ways Cycle tracks RUB/ROB Culverts and Small Bridges Service Ducts Bus Shelter Bus terminals/Stands Truck Terminals Workshops / Depots Traffic Islands 	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment	
	Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules		
	Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 & 1988	Applicable to all activities, which discharge effluents as a result of process or operations.	
	Forest (Conservation) Act, 1980 – as amended in 1988		
	Wildlife Protection Act, 1972	Applicable if the project involves any activities in the reserved forests, village forests, protected forests and other areas as declared by the state government.	
	Wildlife Protection Act, 1972	The act prohibits picking, uprooting, damaging, destroying, acquiring any specified plant from any forest land It bans the use of injurious substances, chemicals, explosives that may cause injury or endanger any wildlife.	
	Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.	
	The Hazardous Wastes (Management And Handling) Rules, 1989	Materials such as sludge, heavy metals, toxic inorganic, oils, emulsions, spent chemicals and Metal-finishing wastes emanating during construction and operation should be stored and disposed of as per the Rules.	
	Air Act, 1987	Obnoxious gases either from the process or from the equipment should not be emitted leading to degradation in air quality	

Sub-Project	Sub-Project investment	Applicability of Environmental Laws and Policies	Remarks	
		Andhra Pradesh Infrastructure Development Enabling Act, 2001	Applicable to all urban infrastructure projects involving private sector involvement in the development, finance, construction and operation and maintenance phases	
	Road Medians	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment	
	• Signals			
	• Street Lights			
	• Sign Boards			
	• Pedestrian ways			
	Fleet Expansion	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment	
Parking	Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.		
Construction & maintenance equipment	Not Applicable			
Area Up gradation	<ul style="list-style-type: none"> • Provision of Physical & Social Infrastructure (In site upgradation without displacement) • Partial Relocation of Slums 	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment	
		Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Applicable to all activities, which discharge effluents as a result of process or operations.	
		Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 &1988		
		Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.	
		The Hazardous Wastes (Management And Handling) Rules, 1989	Materials such as sludge, heavy metals, toxic inorganic, oils, emulsions, spent chemicals and Metal-finishing wastes emanating during construction and operation should be stored and disposed of as per the Rules.	
Critical Citywide Infrastructure	<ul style="list-style-type: none"> • Hospitals • Schools • Reading Rooms / Libraries • Parks and Play Grounds • Cultural Institutions • Marriage Halls / Community halls 	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment	
		Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Applicable to all activities, which discharge effluents as a result of process or operations.	
		Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 &1988		
		Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.	
	• Crematorium	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment	
		Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Applicable to all activities, which discharge effluents as a result of process or operations.	
		Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 &1988		
		Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.	
		The Hazardous Wastes (Management And Handling) Rules, 1989	Materials such as sludge, heavy metals, toxic inorganic, oils, emulsions, spent chemicals and Metal-finishing wastes emanating during construction and operation should be stored and disposed of as per the Rules.	
			Air Act, 1987	Obnoxious gases either from the process or from the equipment should not be emitted leading to degradation in air quality
	• Ambulances	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment	
• Fire Tenders and Other Equipment	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment		

Sub-Project	Sub-Project investment	Applicability of Environmental Laws and Policies	Remarks
	<ul style="list-style-type: none"> Rescue and Relief Equipment during Disasters 		
Organised Market spaces	Shopping/Office Complexes	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment
		Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Applicable to all activities, which discharge effluents as a result of process or operations.
		Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 & 1988	
		Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.
	Vegetable/Fish Markets Slaughter Houses	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment
		Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Applicable to all activities, which discharge effluents as a result of process or operations.
		Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 & 1988	
		Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.
		The Hazardous Wastes (Management And Handling) Rules, 1989	Materials such as sludge, heavy metals, toxic inorganic, oils, emulsions, spent chemicals and Metal-finishing wastes emanating during construction and operation should be stored and disposed of as per the Rules.
		Air Act, 1987	Obnoxious gases either from the process or from the equipment should not be emitted leading to degradation in air quality
	Wildlife Protection Act, 1972	The act prohibits picking, uprooting, damaging, destroying, acquiring any specified plant from any forest land It bans the use of injurious substances, chemicals, explosives that may cause injury or endanger any wildlife.	
	Environment Improvement	<ul style="list-style-type: none"> Lake / Pond Development River Front Development Urban Forestry / Green Belt Recharging of Old Tanks / Wells Recharging of Percolation System Rain Water Harvesting River Cleaning / Dredging 	The Environment (Protection) Act, 1986
Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules			Applicable to all activities, which discharge effluents as a result of process or operations.
Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 & 1988			
Notification on Coastal Regulation Zone, 1991			Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.
The Hazardous Wastes (Management And Handling) Rules, 1989			Materials such as sludge, heavy metals, toxic inorganic, oils, emulsions, spent chemicals and Metal-finishing wastes emanating during construction and operation should be stored and disposed of as per the Rules.
Forest (Conservation) Act, 1980 – as amended in 1988			Applicable if the project involves any activities in the reserved forests, village forests, protected forests and other areas as declared by the state government.
Wildlife Protection Act, 1972			The act prohibits picking, uprooting, damaging, destroying, acquiring any specified plant from any forest land It bans the use of injurious substances, chemicals, explosives that may cause injury or endanger any wildlife.
Integrated	<ul style="list-style-type: none"> CC, BT roads connecting slums to 	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment

Sub-Project	Sub-Project investment	Applicability of Environmental Laws and Policies	Remarks	
Area Development	<ul style="list-style-type: none"> City Expansion/ Extension of existing water supply networks Extension of drainage/ sewerage networks to cover slum areas 	Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Applicable to all activities, which discharge effluents as a result of process or operations.	
		Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 & 1988		
		Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.	
		The Hazardous Wastes (Management And Handling) Rules, 1989	Materials such as sludge, heavy metals, toxic inorganic, oils, emulsions, spent chemicals and Metal-finishing wastes emanating during construction and operation should be stored and disposed of as per the Rules.	
		Forest (Conservation) Act, 1980 – as amended in 1988	Applicable if the project involves any activities in the reserved forests, village forests, protected forests and other areas as declared by the state government.	
		Wildlife Protection Act, 1972	The act prohibits picking, uprooting, damaging, destroying, acquiring any specified plant from any forest land It bans the use of injurious substances, chemicals, explosives that may cause injury or endanger any wildlife.	
		Air Act, 1987	Obnoxious gases either from the process or from the equipment should not be emitted leading to degradation in air quality	
	Andhra Pradesh Infrastructure Development Enabling Act, 2001	Applicable to all urban infrastructure projects involving private sector involvement in the development, finance, construction and operation and maintenance phases		
	<ul style="list-style-type: none"> Construction & maintenance equipment 	Not Applicable	_____	
Sanitation	<ul style="list-style-type: none"> Community toilets Public toilets/ Urinals 	The Environment (Protection) Act, 1986	Any act during implementation causing damage to environment	
		Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Applicable to all activities, which discharge effluents as a result of process or operations.	
		Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 & 1988		
		Notification on Coastal Regulation Zone, 1991	Permissions to be taken for undertaking any activity in the coastal region of 500 m from the HTL.	
			Forest (Conservation) Act, 1980 – as amended in 1988	Applicable if the project involves any activities in the reserved forests, village forests, protected forests and other areas as declared by the state government.
			Wildlife Protection Act, 1972	The act prohibits picking, uprooting, damaging, destroying, acquiring any specified plant from any forest land It bans the use of injurious substances, chemicals, explosives that may cause injury or endanger any wildlife.
			Air Act, 1987	Obnoxious gases either from the process or from the equipment should not be emitted leading to degradation in air quality
		<ul style="list-style-type: none"> Operation and Maintenance Procurement of sanitation related infrastructure 	Not Applicable	_____

DOCUMENT - 11

ENVIRONMENTAL MANAGEMENT PLANS

GENERIC ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
DESIGN / PRE IMPLEMENTATION STAGE – GENERIC			
Change in land Use pattern	Avoid conversion of prime agriculture land and other important land uses Approval from the competent authority should be taken before the conversion. (NA permission) Strict adherence to DP/TP proposals	ULB	Land use policy guidelines MoEF Guide lines
Flooding due to Change in drainage patterns and erosion of top soil	Design should be based on natural drainage pattern, and ensure that there would be less or no impact on the drainage pattern. In unavoidable conditions, measures should be taken to safely dispose the storm water	ULB	Topography, Soil and watershed maps
Impacts due to Excavation /disposal of soil	Identify suitable sites for large quantities of soil excavation	ULB in co-ordination with Ministry of Environment and forests	MoEF guidelines for the specific area, if any
Disturbance to other services during construction	Care should be taken to avoid damage and disturbance to the existing facilities through proper planning	ULB to ordinate with the concerned departments	Contract Document Appropriate construction techniques
Odour nuisance	The activities should be planned and located according to the prevailing wind direction in the area	ULB to co-ordinate with the respective departments	Public Nuisance Act
Decrease in DO Levels in the surface water body and loss of aquatic life	Proper study should be done to locate the disposal site with respect to the water extraction points, water quality and quantity, aquatic life	APPCB	Water Act, 1974 APPCB Standards for waste disposal in to streams
Change in ground water characteristics in terms of quantity and salinity ingress	Proper study should be done regarding soil Characteristics, ground water depth and water quality in case of effluent disposal	ULB	CGWB Guidelines on Ground water extraction
Loss of ecosystems Due to construction And loss of flora and fauna due to new ecosystems	Project sites do not fall under habitat of endangered species listed in wildlife protection Act	ULB in co-ordination with MoEF, Govt. Of A.P	Forest Act Wild life protection Act Bio-diversity conservation Rules
Non-compliance to aesthetic environment	Aesthetic and landscape factor should be included right at he planning stage Local people should be consulted before planning for the activities, which may have high impact on aesthetic environment	ULB and Contractor	Contract document
IMPLEMENTATION / CONSTRUCTION STAGE - GENERIC			
Flooding due to Change in drainage patterns and erosion of top soil	Depending on the intensity of rainfall, topography of the area and obstruction to natural drainage, measures to be taken like leveling the ground surface, creating artificial drainage facilities, provision of dykes to hold run off. Special care should be taken In the low-lying areas where water logging problem is very high careful planning of top cut and –fill to minimize erosion, including resurfacing / re	ULB	Topography, Soil and watershed maps

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
	vegetation of exposed areas Proper resurfacing to be done as soon as the concerned activity is over		
Impacts due to Excavation /disposal of soil	Identify suitable sites for disposal of soil; Disposal in natural drainage areas should be avoided Care should be taken to avoid creation of borrow pits as far as possible, if not, proper care should be taken for human and animal safety and to avoid water logging	ULB in coordination with Ministry of Environment and forests	MoEF guidelines for the specific area, if any
Traffic congestion during construction	Provision of bypass for traffic during construction and planning and organization of engineering work in such away to minimize traffic congestion In heavy traffic areas work can be done at night time and alternatively use construction techniques which will not obstruct the traffic Sign boards should be held at a distance of about 500 m to diver the traffic and about the construction activity	ULB to co-ordinate with the traffic police	Contract document Appropriate Construction Techniques CPCB standards of ambient air quality and vehicular and equipment emission
Disturbance to other services during construction	Necessary warning should be issued to local people about the possible temporary disruption of services, if any Inform to other service providers about the activity and make all arrangements	ULB to ordinate with the concerned departments	Contract Document Appropriate construction techniques
Change in Air quality due to construction, operation and due to traffic increase	Check emission from construction equipments and ensure their proper maintenance proper measures to be taken to arrest smoke and dust. Sprinkling of water to settle down the dust will minimizing the impact All the air polluting appurtenances including the emission from the vehicles used for construction activities Should comply with standards of the SPCB	APPCB in co-ordination with ULB	CPCB standards of ambient air quality and vehicular emissions
Odour nuisance	Create sufficient buffer areas	ULB to co-ordinate with the respective departments	Public Nuisance Act
Decrease in DO Levels in the surface water body and loss of aquatic life	Proper measures to be taken to contain the run off from construction sites to avoid contamination and sediment loading of water body	APPCB	Water Act, 1974 APPCB Standards for waste disposal in to streams
Change in ground water characteristics in terms of quantity and salinity ingress	The ground water abstraction should be restricted to permissible limit. Ground water balance must be taken in to consideration while using groundwater as a source	ULB	CGWB Guidelines on Ground water extraction
Increase in noise levels due to construction and operation	Check for noise levels of construction equipment construction activities with moderate to high noise levels should be carried out as far as possible only during daytime	ULB in coordination With APPCB	Noise pollution rules
Loss of ecosystems due to construction and loss of flora and fauna due to new ecosystems	Activities should not be allowed in the eco-sensitive regions. Reforestation should be done, in case of any cutting down trees. Alternative routes should be assessed for minimizing the damage wherever possible. Under unavoidable circumstances the wildlife species should be transported to protected areas	ULB in co-coordination with MoEF, Govt. of A.P	Forest Act Wild life protection Act Bio-diversity conservation Rules
Public safety	Employ safe engineering practices during construction	ULB	IS 12314: 1987 (safety distance from other services) Safety guidelines of PWD, IRC
POST IMPLEMENTATION/ OPERATIONAL STAGE - GENERIC			
Increase in traffic after completion of project	Incase of probable high increase in traffic existing infrastructure facilities should be studied, and necessary improvements or alternative arrangements for the expected traffic	ULB	IRC guidelines of V/C ratio and speed of vehicles

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
	should be made		
Change in Air quality due to construction, operation and due to traffic increase	Proper checking through out the operations	APPCB in co-ordination with ULB	CPCB standards of ambient air quality and vehicular emissions
Odour nuisance	Regular maintenance to avoid o dour nuisance and efficient operation or technology, which has less odour nuisance Create sufficient buffer areas	ULB to co-ordinate with the respective departments	Public Nuisance Act
Nuisance due to insects and files	Ensure measures to reduce vector formation Biological vector control methods can also be tried as alternative Avoid leakages overflow and clogging of sewage /water lines through maintenance and operation stagnation of water or sewage and solid waste dumping should be completely avoided. Spraying of insecticides to avoid spread of vectors is advisable	ULB	Solid waste management rules
Decrease in DO Levels in the surface water body and loss of aquatic life	Check the disposal effluent characteristics Carry out study of water budget with respect to the surface water bodies with respect to the quantity and check for the quality parameters	APPCB	Water Act, 1974 APPCB Standards for waste disposal in to streams
Change in ground water characteristics in terms of quantity and salinity ingress	Withdrawal of ground water should be controlled and regulated	ULB	CGWB Guidelines on Ground water extraction
Increase in energy loads	Ensure proper operation and maintenance such that all the appurtenances are complying with standards. Ensure proper measure to arrest noise, avoid use of high noise producing equipments during night time in case high noise levels During operation, permanent noise barriers should be provided for their safety	ULB in coordination With APPCB	Noise pollution rules
Loss of ecosystems Due to construction And loss of flora and fauna due to new ecosystems	Alternative plantation activity in the nearby areas, which can support the species like to be uprooted from the ecosystem Effort should be made to restore the ecosystem as far as possible	ULB in co-ordination with MoEF, Govt. of A.P	Forest Act Wild life protection Act Bio-diversity conservation Rules
Public safety	Rigorous implementation of policies through local officers, periodic visits to sites to gauge the implementation, creating awareness among people, taking help of CBO/local NGO's to oversee the compliance, issuing warnings to the people	ULB	IS 12314: 1987 (safety distance from other services) Safety guidelines of PWD, IRC
Fire hazards	Ensure proper fire fighting measures with skilled persons for operation Check the preparedness of the equipment and team with regular training and maintenance of equipment		

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
	Training should be provided to the workers involved in fire risky activities		

1. WATER SUPPLY – ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
DESIGN / PRE IMPLEMENTATION STAGE			
Change in ground water quality and salinity intrusion in coastal aquifers due to over exploitation	Study ground water balance details	ULB	CGWB Guidelines on groundwater Extraction
Non-availability of water from source	Care needs to be taken while selecting the source depending upon the availability of water Detailed study of the availability of water from the source should be done before opting for the source	ULB	-----
Water logging due to leakages and overflows	All pipe appurtences should be tested before laying	ULB	Conform to IS 11906: 1986 CPHEEO Manual
IMPLEMENTATION / CONSTRUCTION STAGE			
Change in ground water quality and salinity intrusion in Coastal aquifers due to over exploitation	Ensure extraction to be within permissible limits, so that the ground water budget is maintained	ULB	CGWB Guidelines on groundwater extraction
Contamination of water source	Proper safety measures should be taken during construction Phase so that the water bodies are not polluted	ULB& APPCB	WaterAct, 1974 APPCB standards for waste disposal in to streams
Water logging due to leakages and overflows	Ensure proper design network	ULB	Conform to Is 11906: 1986 CPHEEO Manual
Increase in Noise levels due to running of treatment plant	Proper measures should be taken to arrest the noise (Noise Barriers)	ULB in co-ordination with APPCB	Noise pollution Rules Standard noise levels for specific land use
Increase in energy loads	Ensure less number of pumping stations in network through proper design	Integrate with the local topography Of the city	Cumulative records energy consumption
OPERATION / MAINTENACE STAGE			
Change in ground water quality and salinity intrusion in Coastal aquifers due to over exploitation	Ground water withdrawal should be restricted, controlled and regulated	ULB	CGWB Guidelines on groundwater Extraction
Contamination of water source	Ensure testing of water samples	ULB& APPCB	WaterAct, 1974

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
			APPCB standards for waste disposal in to streams
Water logging due to leakages and overflows	Ensure improved leakage detection and repair techniques Ensure proper maintenance of network	ULB	Conform to Is 11906: 1986 CPHEEO Manual
Increase in Noise levels due to running of treatment plant	Check for noise levels during operation	ULB in co-ordination with APPCB	Noise pollution Rules Standard noise levels for specific land use
Land pollution due disposal of waste	Ensure disposal site away from treatment plant	APPCB	Water Act, 1974 APPCB standards for waste disposal onto land
Impacts during operation and maintenance	Avoid stagnant water pools and water logging Check for water contamination during transmission	ULB	CPHEEO Manual on water supply

2. SEWERAGE SUBPROJECTS – ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
DESIGN / PRE IMPLEMENTATION STAGE – SEWERAGE			
Impacts due to overflow of sewers	Ensure proper designing of sewer lines	ULB	IS: 458-1988 (Sewers) CPHEEO Manual on sewerage
Change in ground water quality due to leaching from treatment plant	Proper study should be made regarding the groundwater table and soil characteristics	ULB	IS 11906:1986 For guide lines of lining Solid waste management rules
Decrease in DO Levels of the water bodies and eutrophication due to disposal of treated waste/sludge	Proper design of outfall Sewers Proper selection of water intake point	APPCB	APPCB norms of waste disposal in to water bodies and onto land
Increase in noise levels due to running of treatment plant	Proper selection of treatment plant site Ensure proper designing maintenance and provision of adequate buffer areas	Adhere to the standards to the APPCB	CPHEEO Manual for design and maintenance CPCB standard Noise levels for specific land use
IMPLEMENTATION / CONSTRUCTION STAGE – SEWERAGE			
Contamination of ground water and surface water sources and creation of stagnant pools of wastewater due to over flows and leakages	Proper construction should be done for the system and all the appurtences should comply with standards.	ULB	APPCB norms of waste disposal IS: 458-1988 (sewers) IS 2064: 1993 (installation and maintenance of sanitary appliances) IS 11272: 1985 for basic requirements of drainage system

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
Decrease in DO Levels of the water Bodies and Eutrophication due to disposal of treated waste/sludge	Select disposal site according to the water body characteristics Confirm detailed study of receiving water body characteristics and aquatic life	APPCB	APPCB norms of waste disposal in to water bodies and onto land
Loss of Aquatic life	Proper location of disposal point	APPCB	Same as above
Change in groundwater quality due to leaching from toilets and septic tanks etc	Proper surfacing to be done to avoid leaching, in case shallow depth ground water it is advisable to make proper arrangements Conform to IS 12314:1987 for safety distance from other services	ULB& APPCB	IS 2064:1993 For construction CPHEEO Manual
OPEARTION STAGE – SEWERAGE			
Contamination of ground water and surface water sources and creation of stagnant pools of wastewater due to over flows and leakages	Minimize detection and repair timing through efficient methods Ensure proper operation and maintenance should be done for the system and all the appurtences should comply with standards	ULB	APPCB norms of waste disposal IS: 458-1988 (sewers) IS 2064: 1993 (installation and maintenance of sanitary appliances) IS 11272: 1985 for basic requirements of drainage system
Impacts due to overflow of sewers	Ensure power supply during sewage pumping so that sewers do not overflow Ensure the self-cleaning velocity of the sewerage network	ULB	IS: 458-1988 (sewers) CPHEEO manual on sewerage
Change in ground water quality due to leaching from treatment plant	Control of nitrate and microbial pollution of ground water	ULB	IS 11906:1986 for guide lines of lining Solid Waste Management Rules
Decrease in DO levels of the water bodies and eutrophication due to disposal of treated waste/sludge	Ensure proper treatment efficiency as per design standards Ensure effluent characteristics as per standards	APPCB	APPCB norms of waste disposal in to water bodies and onto land
Loss of Aquatic life	Protection of aquatic ecosystem near outfall location	APPCB	Same as above
Increase in noise levels due to running of treatment plant	Noise generating equipments should conform to the standards	Adhere to the standards to the APPCB	CPHEEO manual for design and maintenance CPCB standard on noise levels for specific land use
Nuisance due to Insecticides and Flies	Cleanliness near the pumping stations, septic tank, and toilets should be maintained Periodic checks for overflows and leakages should be conducted, stagnation of water and sewage should not be there	ULB	
Change in groundwater quality due to leaching from toilets and septic tanks etc	Ensure proper maintenance of toilets and constant water for flushing	ULB& APPCB	IS 2064:1993 for construction CPHEEO manual
Health Hazards due to vector formation	Avoid leaks and overflow from main trunk lines Stagnation of water or sewage should be completely avoided Spraying of insecticides to avoid spread of vectors is advisable		

3. SOLID WASTE MANAGEMENT SUBPROJECTS – ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
DESIGN / PRE IMPLEMENTATION STAGE - SOLID WASTE MANAGEMENT			
Nuisance due to odour, due to flies and insects from dumpsites	Wind direction should be taken in to consideration while selecting the site Avoid locating dumping sites near the water bodies, residential areas, schools, colleges and hospitals	ULB	Municipal Solid Waste Rules, 2000
Location of landfill sites	Land acquired for land fill sites should not be agriculture cultivable waste or grazing land	ULB & APPCB	Municipal Solid Waste Rules, 2000
Contamination of groundwater resources due to leaching from solid waste	Conduct detailed survey regarding groundwater table and soil characteristics before selection of dumping site to prevent leachate percolating to Ground water	APPCB	Municipal solid waste Rules, 2000 Hazardous waste management rules
CONSTRUCTION / IMPLEMENTATION STAGE - SOLID WASTE MANAGEMENT			
Location of landfill sites	During construction of landfill site ensure 3m above the ground water table	ULB & APPCB	Municipal solid Waste Rules, 2000
Contamination of groundwater resources due to leaching from solid waste	Ensure proper surfacing of dumping site	APPCB	Municipal solid waste Rules, 2000 Hazardous waste management rules
Land and water pollution due to spillage of asphalt, Tar and hazardous materials	Ensure proper storage and working conditions for materials Ensure skilled workers to handle hazardous substances	APPCB & ULB	Hazardous waste handling and management rules IRC guidelines
Decrease in ground water recharge due to surfacing	Ensure alternative arrangements for ground water recharge	-	--
Air pollution and noise due to increase in traffic	Ensure proper arrangements to control dust pollution. Provide green belts on the road	APPCB	APPCB ambient air quality standards
Impacts due to mining of road construction materials	Minimize usage of construction materials through proper planning and designing	Ensure that the mining areas are not notified by the department of Environment as sensitive areas	Forest Act Wildlife Act Bio-diversity conservation rules
OPERATION STAGE - SOLID WASTE MANAGEMENT			
Nuisance due to odour also due to flies and insects from dump sites	Ensure proper frequency of collection and regular disposal of waste Ensure that no residue is left after collection Bins of sufficient capacity should be provided for collection of waste to avoid overflow Ensure proper safety measures like spraying of insecticides etc at the collection centers to avoid spread of epidemics	ULB	Municipal solid Waste Rules, 2000
Spillage of solid waste from trucks During transportation	Avoid open trucks for transporting waste, if incase, ensure that the top is covered and there is no overloading Identify shortest route from collection Point to disposal point to minimize the travel distance and there by increasing the frequency of trips		IS – 12402 1988 Municipal Solid Waste Rules, 2000
Health risk of sanitation workers	Ensure safety measures for workers	ULB	

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
	Provide training to the workers with respect to health risk, and safety in handling solid waste		
Air pollution due to burning of waste	Avoid burning of wastes which are Hazardous in nature e.g., plastics, biomedical wastes	ULB &APPCB	Municipal Solid Waste Rules, 2000
Contamination of groundwater resources due to leaching from solid waste	Municipal solid waste managing authority should ensure that waste from non-residential areas for disposal are approved only after certification from SPCB that the waste is non-hazardous	APPCB	Municipal Solid Waste Rules, 2000 Hazardous Waste Management Rules
Others	Ensure Biomedical waste is not mixed with the municipal solid waste Ensure proper safety measures during epidemics	ULB	Bio-medical Waste Management Rules

4. ROADS AND TRANSPORT SUBPROJECTS – ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
DESIGN / PRE IMPLEMENTATION STAGE - ROADS AND TRANSPORT			
Flooding due to change in drainage pattern	Careful planning and designing of road network considering the natural drainage pattern	ULB	IRC: 15-1981: IRC: 19-1977: IRC: 86-1983: SP: 20-1979 for Design considerations
Decrease in ground water recharge due to surfacing	Ensure alternative arrangements for groundwater recharge		
Traffic Congestion	Check V/C ratio through proper projections	APPCB &ULB	Hazardous waste handling and management rules IRC guidelines
Impacts due to mining of road construction materials	Avoid mining in ecologically sensitive and protected areas	Ensure that the mining areas are not notified by the department of Environment as sensitive areas	Forest Act Wild Life Act Bio-diversity conservation rules
Road accidents	All street/ road appurtenances like street lightning etc should be properly planned, designed and maintained	ULB, Traffic police	IS 12314: 1987 (safety distance) Safety guidelines of IRC For traffic signals and road signs compliance to IRC: 93-1985; IRC: 67-1977
Change in land use due to construction	Ensure proper land use planning before implementation of the road projects		Proposed land use plan, if any Conform to IRC
OPERATION STAGE - ROADS AND TRANSPORTATION			
Flooding due to change in drainage pattern	Ensure alternative drainage facilities	ULB	IRC: 15-1981, IRC: 19-1977: IRC: 86-1983, SP: 20-1979 for

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
			design considerations
Land and water pollution due to spillage of asphalt, Tar and hazardous materials	Careful operation and maintenance and emergency clean up of hazardous materials	APPCB & ULB	Hazardous waste handling and management rules IRC guidelines
Decrease in ground water recharge due to surfacing	Ensure alternative arrangements for ground water recharge	-	--
Air pollution and noise due to increase in traffic	Ensure standard emissions from vehicles Regular monitoring of the noise levels on the road during operational phase will help in keeping track of the noise levels over a period of time Ensure proper maintenance of the roads during operational phase, especially during monsoons. One of the main reason for the high SPM levels in the ambient air is poor condition of road network	APPCB	APPCB ambient air quality standards
Road accidents	Check the speed of the moving vehicles Avoid stagnant water pools on the network by care full design of road drainage facilities	ULB, Traffic police	IS 12314: 1987 (safety distance) Safety guidelines of IRC For traffic signals and road signs compliance to IRC: 93-1985; and IRC: 67-1977

5. STORM WATER DRAINAGE SUBPROJECTS – ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
DESIGN / PRE IMPLEMENTATION STAGE - STORM WATER DRAIN			
Change in water quality of receiving body	Avoid mixing up of domestic and industrial effluent with storm water through proper checking and maintenance Check for uncontrolled run of the system	APPCB	APPCB norms for disposal
Increase in sediment load of the water body	Ensure regular operation and maintenance of the system	ULB	Design as per CPHEEO Manual
Flooding of down stream areas incase of improper drainage facilities	Ensure proper selection of outfall point with respect to down stream areas	ULB	IS 11272: 1985 for drainage system
Increase in sediment load of the water body	Proper design of slope to avoid scouring and overflow due choking	ULB	Design as per CPHEEO Manual
IMPLEMENTATION / CONSTRUCTION STAGE - STORM WATER DRAIN			
Water logging due to improper drainage facilities and street design	Ensure provision of drainage facilities along road network	ULB	Road/street design and construction should comply to IRC: 15-1981, IRC: 19- 1977, IRC: 86-1883, IRC: SP-20- 1979 CPHEEO Manual

6. AREA UPGRADATION SUBPROJECTS – ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
DESIGN / PRE IMPLEMENTATION - AREA UP GRADATION			
Water logging due to improper drainage facilities and street design	Ensure proper design of streets according to the topography	ULB	Road/street design and construction should comply to IRC: 15-1981, IRC: 19-1977, IRC: 86-1883, IRC: SP-20- 1979 CPHEEO Manual
Area Upgradation			
Water logging due to improper drainage facilities and street design	Ensure proper facilities for disposal of storm water	ULB	Road/street design and construction should comply to IRC: 15-1981, IRC: 19-1977 , IRC:86-1883, IRC : SP-20- 1979 CPHEEO Manual
Water logging /formation of stagnant water pools	Ensure no leakages from water distribution and sewerage lines Ensure proper maintenance of road network and drainage facilities	ULB	
Unhygienic conditions due to solid waste dumping	Ensure collection of solid waste at regular intervals Increase awareness among the slum dwellers regarding handling waste	ULB	Solid waste management rules, 2000
Unhygienic condition due to toilets	Ensure regular maintenance Ensure proper waste collection and disposal facilities Awareness among people towards health and hygiene	ULB	--+--
<i>Health hazards due to flies and insecticides</i>	Ensure that there no stagnant water pools, sewage overflows and improper dumping sites Spraying of insecticides and pesticides are advisable at regular intervals	ULB	

7. CRITICAL CITY WIDE INFRASTRUCTURE SUBPROJECTS – ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
Critical City Wide Infrastructure			
Change/ impact on surrounding land use	Identification and provision of land in the DP Strict adherence to DP/TP proposals Approval from the competent authority should betaken before the conversion	ULB	Proposed land use plan
Congestion due to non availability of parking facilities	Ensure sufficient land availability and proper planning of the surrounding land use for parking facilities	ULB	-----
Change in water quality and air quality	Site selection should be based on the prevailing wind direction	APPCB	-----
CONSTRUCTION / IMPLEMENTATION STAGE - CRITICAL CITYWIDE INFRASTRUCTURE			

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
Congestion due to non availability of parking facilities near the crematorium	Avoid traffic congestion by providing space for parking	ULB	
Change in water quality and air quality due to disposal of ash from crematorium	Proper study regarding the ground water table and soil characteristics prior to selection of disposal site	APPCB	
OPERATION STAGE - CRITICAL CITY WIDE INFRASTRUCTURE			
Congestion due to non availability of parking facilities near the crematorium	Provision of space for parking	ULB	
Change in water quality due to discharge of waste water from hospitals, crematorium	Ensure proper collection and disposal of waste water Ensure proper treatment of hospital waste prior to its disposal. Regular testing and monitoring is advisable		APPCB effluent discharge standards
Health risk due to storage, collection, transportation and disposal of bio-medical waste	Ensure proper training to the personnel involved in the process from storage to disposal Regular monitoring is a must. Avoid burning of bio medical waste Ensure proper treatment and disposal of biomedical waste	APPCB	Bio-medical waste management Rules
Health impacts due to continuous exposure to electric waves	Care should be taken for storage of ash in the premises. Storing in a closed container or covering is advisable. Avoid open/crude dumping of ash, especially in natural drainage areas. Care should be taken while transportation of ash to disposal site. Ensure that, ash is transported in closed containers	APPCB	

8. ORGANISED MARKET AREAS – ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
Organized Market Areas			
Impact on surface and groundwater sources due to effluent from slaughter houses	Proper study should be done with location of disposal site with respect to water quality and aquatic life	APPCB	APPCB Norms on effluent disposal
Increase in noise levels due to allied activities at complexes/markets	Ensure site selection away from sensitive areas	ULB	Standard noise levels
Traffic congestion	Avoid traffic congestion with better planning and management	ULB	As specified earlier

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
Land pollution due to disposal of waste from slaughter houses and vegetable markets	Detailed study of the GW table depth and soil characteristics for locating disposal site	CPCB	Hazardous and Solid waste management rules Water Act, 1974
Organized Market Areas			
Impact on surface and groundwater sources due to effluent from slaughter hoses	Detailed study receiving body characteristics and aquatic life	APPCB	APPCB Norms on effluent disposal
Traffic congestion	Avoid road encroachments especially in market and commercial areas	ULB	As specified earlier
Land pollution due to disposal of waste from slaughter houses and vegetable markets	Ensure proper design and construction of disposal site especially for slaughter house wastes	CPCB	Hazardous and Solid waste management rules Water Act, 1974
Organized Market Areas			
Impact on surface and groundwater sources due to effluent from slaughter hoses	Ensure proper collection, treatment and disposal of waste water especially from slaughter houses Regular monitoring of effluent form slaughterhouses is a must.	APPCB	APPCB Norms on effluent disposal
Impacts due to storing, dumping/disposal of solid waste	Ensure regular collection frequency of waste from markets/slaughter house Care should be taken in disposing bio-degradable waste Avoid open/crude dumping of vegetable/markets waste especially in natural drainage areas	APPCB & ULB	Solid waste management rules Hazardous waste management rules
Health hazards due to unhygienic conditions	Care should be taken to avoid stagnant water pools Ensure proper frequency of collection, of market wastes Spraying of insecticides and pesticides is advisable	ULB	
Odour nuisance from biodegradable waste	Cleanliness near storage and cleaning sites should be maintained. Stagnation of water pools should be completely avoided. Ensure collection frequency of solid waste at regular period Create sufficient buffer areas		
Nuisance due to insecticides and files	Ensure proper cleaning and maintenance of surrounding areas Spraying of insecticides at regular intervals is advisable	ULB	
Fire hazards especially in cold storage units	Ensure proper fire fighting measures with skilled persons Ensure proper safety measures for workers and training	ULB	Fire safety and hazard rules
Land pollution due to disposal of waste from slaughter houses and vegetable markets	Ensure proper storage and regular collection of waste from market to avoid leaching	CPCB	Hazardous and Solid waste management rules Water Act, 1974
Increased stress on water resources and change in groundwater characteristics and ground conditions due to over exploitation	Ensure that rate of extraction should not exceed the permissible limit. Alternative source of water should be identified Increase awareness among the people to conserve water	ULB	
Decrease in ground water recharge due to new development and surfacing	Ensure alternate arrangement for ground water recharge	ULB	
Contamination of water resources	Avoid improper dumping of solid waste near the water bodies Ensure the effluent treatment to standards before discharge	APPCB	APPCB norms
Change in air quality due to increase	Provide sufficient green belt along roads	APPCB	

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
in traffic	Ensure regular maintenance of road network Ensure proper surfacing of road network		

9. INTEGRATED AREA DEVELOPMENT – ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
Integrated Area Development			
Change in land use pattern	Avoid conversion of prime agricultural land and other important land uses Ensure proper land use planning before implementation of project Approval from the competent authority should be taken before the conversion (NA permission)	ULB	Same as mentioned earlier
Impacts due to mining of construction materials	Identify suitable sites for large quantities of soil excavation	ULB and MEF	As mentioned earlier
Increased stress on water resources and change in groundwater characteristics	Ensure availability of water resources	ULB	
Increased stress on infrastructure facilities	Conduct detailed study of existing infrastructure	ULB	
Integrated Area Development			
Impacts due to mining of construction materials	Care should be taken to avoid creating of borrow pits as far as possible, if not, proper care should be taken for human and animal safety and to avoid water logging	ULB and MEF	As mentioned earlier
Contamination of water resources	Proper measures should be taken to contain runoff from constructions sites	APPCB	APPCB norms
Change in air quality due to increase in traffic	Ensure emission standards from construction equipment and all vehicles	APPCB	

10. ENVIRONMENTAL IMPROVEMENT – ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
Environmental Improvement			
Impacts on natural Ecosystem due to increased movement	Protect natural habitats	ULB, MoEF	Wildlife Act Bio-diversity Conservation rules
Change in land use due to increased accessibility	Ensure proper zoning before implementing any project	ULB	Same as mentioned earlier
Urban congestion /stress on other	Proper study should be made regarding the existing facilities and developed due to	ULB	

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING INSTITUTION	REFERENCE DOCUMENTS
facilities	future stress		
IMPLEMENTATION / CONSTRUCTION STAGE – ENVIRONMENTAL IMPROVEMENT			
Impacts on natural Ecosystem due to increased movement	Avoid activities in eco-sensitive areas Avoid /minimize noise and disturbances as far as possible	ULB, MoEF	Wildlife Act Bio-diversity Conservation rules
Out break epidemics during peak tourists visits	Provide emergency centers in all tourism sites to avoid any accidents	ULB	--
OPERATIONAL STAGE – ENVIRONMENTAL IMPROVEMENT			
Impacts on natural Ecosystem due to increased movement	Provide noise barriers to avoid disturbance to birds /animals Avoid /minimize noise and disturbances as far as possible Increase awareness among the tourists about the environment and ecosystem	ULB, MoEF	Wildlife Act Bio-diversity Conservation rules
Impacts due to disposal of waste from tourism related activities	Ensure proper collection and disposal of waste Ensure proper treatment of waste before disposal Provide solid waste collection bins in the tourism Areas	APPCB	--
Air pollution due to increased activities	Ensure proper surfacing of roads Ensure proper maintenance of roads Ensure vehicle emission well within standards Provide parking area near tourism	APPCB	Air pollution norms
Out break epidemics during peak tourists visits	Ensure proper sanitation facilities and proper maintenance should be taken care Check for proper cleanliness around tourism site	ULB	--

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ENVIRONMENTAL MONITORING PLAN

CONSTRUCTION PHASE

Monitoring Item	Monitoring details	Monitoring Indicator	Frequency	Responsible Institution
Construction Noise	Measure Construction noise near sensitive areas. Plan showing sensitive areas such as hospitals/schools near the project area should be prepared	Noise level in dB Noise levels should confirm to CPCB/APPCB standards	Once in two weeks (Randomly selected)	ULB in co-ordination with APPCB
Dewatering Flooding & Erosion Protection	Inspect for flooding and erosion control measures as specified in EMP	Flooding area Erosion control; Cleared off area and protected area	Once at each stage: Before construction and during construction	ULB
Air quality	Measure the air quality around the Sources and surrounding area. Check the emissions from construction equipment and other machinery Inspect dust suppression Measures	SPM, SO ₂ , NO _x in ambient air. Check the machinery emissions against CPCB standards	Once in two weeks (24 hours Monitoring on a randomly selected day)	ULB in co-ordination with APPCB
Water Quality	Check the effluent characteristics from the project site. Collect water samples form down streamside of the disposal point. Follow standards sampling procedures	Physical and Chemical Parameters, Colour, temperature, TS, Do, BOD, MPN) Compare with CPCB/APPCB standards and water quality (pre-construction period)	Once in two weeks	ULB in co-ordination with APPCB, ULB has to undertake quality checking)
Construction waste and other non-biodegradable waste	Inspect disposal system	Quantity of waste disposed Disposal site as specified in EMP	Once in four Weeks	ULB
Bio-degradable waste	Check collection, storage and disposal system. Leaching at the disposal site	Waste characteristics Quantity of waste Disposal system	Once in two weeks	APPCB in co-ordination with ULB
Disturbance to other services	Inspect project area if proper care is taken to mitigate or reduce the disturbance as specified in EMP/Contract	Inspect site according to EMP/Contract	Once a month	ULB

OPERATION PHASE

Monitoring Item	Monitoring details	Monitoring Indicator	Frequency	Responsible Institution
Groundwater quality in case of groundwater source	Monitor groundwater depletion groundwater quality and groundwater balance	Depletion rate per year Change in groundwater quality	Twice in a year pre monsoon and post monsoon season	ULB in co-ordination with HMWSSB APPCB- quality
Water quality	Examine source water quality be employing proper sampling methods	Physical, chemical and biological characteristics (should comply to drinking water standards after treatment)	Daily before treatment and after treatment	ULB
Leakages and overflows	Monitor the leakages and overflows from water supply system	Leak detection and repair timing No of leaks per month % of wastage to total water supply	Once in a month Cumulative records	ULB
Noise due to running of treatment plant	Measure noise at sensitive locations such as Schools/hospitals and at the treatment plant	Noise levels in dB	24 hours day Once in 4 months	ULB
Waste from treatment plant	Check waste water disposal system Solid waste disposal system	Characteristics of solid waste and quantity of waste.	Once in a months Once in year	APPCB/ ULB

		Characteristics of disposal site- soil and ground water		
Efficiency of water supply system		nt Efficiency Consumption	Once in year	ULB
SEWERAGE SYSTEM				
Leakages and overflows	Monitor the leakages and overflows in the system and creation of stagnant water pools	Leak detection and repair timing NO. of leaks per month Quantity of sewage reaching the treatment plant	Once in a month	ULB
Sewage treatment	Examine the effluent characteristics	Chemical and biological characteristics of sewage	Twice per day at inlet & outlet	APPCB
Change in water quality and aquatic life of the receiving body	Examine the water quality of the receiving body near the down stream of discharge point	Monitor bacterial contamination of surface waters Characteristics of receiving water boides Flora & Fauna	Twice in a year (dry season and wet season) with in 500m and 1000m of U/S and D/S stream of outfall sewer	
Seepage from community toilets and septic tanks	Ground water quality and surface water quality	Monitor coliform in surface waters	Twice in a year	ULB
Groundwater pollution	Check soil and groundwater quality near the sludge disposal site	Groundwater characteristics	Twice in a year (pre & post monsoon seasons)	
Noise due to running of treatment plant	Measure noise at sensitive locations such as Schools/hospitals near the treatment plant	Noise levels in dB	24 hours day once in 3 months	ULB
Vector Formation	Check formation of stagnant polls due to choking, leakages and over flow of sewers, septic tanks, treatment plant etc and un-healthy conditions due to operation of sewerage system	Sanitary checks	Once in 3 months	ULB
STORM WATER DRAINAGE				
Change in water quality of receiving body	Monitor water quality before and after discharge with in 1000m of U/S and D/S	Monitor SS, DO, BOD faecal coliform, and Turbidity of receiving waterbody Monitor Fisheries production	Daily	ULB in coordination with APPCB
Mixing of sewage with storm water	Monitor sewage mixing into storm drains	Measure of quantity of sewage at SPS Monitor fish production	Once in a week during rainy season	ULB
Increase in sediment load in the water body	Monitor regular operational and maintenance of system	Silt accumulation rate Physical and Chemical Characteristics of water.	Twice in year before (before and after monsoon)	ULB and irrigation dept. with APPCB
Flooding due to improper drainage facilities	Follow flooding and water logging measures as mentioned in EMP	Area effected by Flooding/water logging	Thrice in year before, after and during monsoon	ULB
SOLID WASTE MANAGEMENT				
Nuisance due to flies and insectides	Inspect measures taken as specified in EMP	Frequency of waste collection Sanitary checking	Once in week	ULB coordination with APPCB
Spillage during transportation	Overloading and top covering	Loading, top cover in case of open trucks	Once in a month	ULB
Condition of transporting	Check operation and maintenance vehicles	Check for vehicle exhaust	Once in six months	ULB in coordination with Health department
Health risk of sanitation worker	Monitor the health status of the workers	Health status/ loss of man days due to health conditions	Once in three months	ULB in coordination with Health department
Air pollution due to burning of solid waste	Ambient air quality	Measure SPM, SOX NOX dioxin and hazardous gases and vapour	Once in six moths	ULB in coordination with APPCB
Ground water pollution	Check soil and ground water level near the disposal point	Ground water quality Approval of non hazardous waste from concerned	Twice in a year (pre and post monsoon season)	APPCB/HMWSB ULB in coordination with Health

		authority		department
ROADS AND TRANSPORTATION				
Increase in Noise due to traffic movement	Monitor noise levels near sensitive area and residential areas	Noise levels in db	Once every two weeks	ULB/APPCB
Erosion Protection	Inspect whether erosion mechanisms are followed as in EMP	Flooding area Cleared off area with erosion control	Once in each period during construction and after completion	ULB along with UDA
Dust	Ensure proper dust suppression mechanisms as specified in EMP	Measure SPM levels	Check the ambient air quality every month	APPCB
Air pollution due to increase in traffic	Monitor emissions from vehicles Inspect maintenance of roads as in EMP	SPM, SO ₂ CO and Nox and Ensure with CPCB norms	Once in week	APPCB
Road accidents	Proper maintenance of street appurtences Avoid stagnant water pools along roads	Speed of moving vehicles Check for proper street appurtences	Twice a year	ULB
Reduction in ground water recharge	Ground water recharge and depletion Check measures taken as specified in EMP	Ground water depth	Twice a year	ULB in co-ordination of HMWSSB
AREA UPGRADATION				
Water supply system	As specified under water supply project			
Sewerage system	As specified under sewerage project			
Storm water drainage	As specified under storm water project			
Roads	As specified under roads project			
Solid waste management	As specified under solid waste management project			
Un—hygienic conditions	Sanitary checks	Monitor at	Once a week	ULB
	Monitor health status of slum dwellers	Public water taps Public toilets Solid waste collection points	Once a Month	
Water pollution due to slaughter houses	Waste water characteristics	Water quality parameters (SS, DO, BOD, COD and faecal coliform) Receiving water body characteristics treatment and disposal Soil quality	Twice a year (Once in wet season and dry season)	APPCB
Land pollution due to slaughter houses	Waste water disposal sites Solid waste disposal sites	Same parameters as above Solid waste characteristics , treatment and disposal Soil quality	Once a year	APPCB
Ground water pollution	Monitor waste disposal sites	Leaching from disposal sites Monitor ground water Quality near the site	Once in year	APPCB
Nuisance due to insects and flies	Check formation of stagnant pools due to leakages and overflow of waste water , solid waste dumping	Sanitary Checking frequency of waste collection Health status	Once a week	ULB
Odour nuisance	From slaughter houses and markets	Odour Monitor measures taken as mentioned in EMP	Once month	ULB
Increase in noise levels	Monitor of noise levels at sensitive locations near markets	Noise in decibles	Once a month	ULB
Solid waste disposal	Mode of disposal Collection of solid waste	Frequency of collection Dumping site Distance from collection Point to disposal point	Once in week	ULB
Public safety	Monitor accidents and health status	No of acciden Disease pattern	Once in month	ULB
Fire hazards	Monitor measures taken As mentioned in EMP Monitor availability and preparedness of fire fighting unit	No of fire hazards Preparedness by means of time taken	Review once in three months	ULB

CRITICAL INFRASTRUCTURE				
Traffic congestion	Compliance with EMP measures	Vehicle speed V/C ratio	Once in three months	ULB
Health risk	Monitor bio-medical waste handling and disposal	Collection system Disposal method	Once in a month	ULB
Change in air quality due to ash from crematorium	Monitor ash storage ,transportation and disposal facilities	Monitor air quality (SPM) Spillage due to transportation Method of dumping	Twice in a year	ULB in co-ordination with APPCB
Health impacts due to continuous exposure to electric waves	Health status of workers Safety measures	Disease pattern	Once in six months	ULB
INTEGRATED AREA DEVELOPMENT				
Flooding and water logging due to change in drainage pattern	Monitor measures taken as specified in EMP	Area affected by water logging	Thrice in a year before, after and during monsoon	ULB
Increased stress on water sources	Monitor measures As specified in EMP Ground water depletion In case of ground water source	Ground water depletion rate Ground water quality – hardness, chlorides Sulphates) Supply to other parts areas in the city in terms of lpcd	Once in three months	ULB
Air pollution due to increased traffic movements	Ambient air quality provision of green belt along pathway Proper surfacing of road network	SPM, Sox, Nox parameters in the ambient air	Twice a year	ULB in co-ordination with APPCB
Increase in noise levels	Measure noise near sensitive areas	Noise levels in db	Twice in a year	ULB in co-ordination with APPCB
ENVIRONMENT IMPROVEMENT				
Flooding and water logging due to change in drainage pattern	Monitor measure taken as specified in EMP	Area affected by flooding and water logging No of people affected	Thrice in a year before after and during monsoon	ULB
Decrease in DO levels due to discharge effluent	Monitor water quality flora and fauna	Measure water quality parameters (TS< DO< BOD and faecal coliform)	Once a month	ULB in co-ordination with APPCB
Erosion of soil	Erosion of banks and bed due to increased river water velocity	Physical observation Silt content in the water body	Once a year	ULB in co-ordination with Irrigation dept
Increase in noisy levels	Measure noise near sensitive areas	Noise levels in db	Twice in a year	ULB in co-ordination with APPCB

DOCUMENT - 13

TERMS OF REFERENCE FOR ENVIRONMENTAL ASSESSMENT OF SUB-PROJECTS

Background:

Andhra Pradesh Urban Reforms and Municipal Services Project (APURMSP) is an innovative partnership project of Government of Andhra Pradesh (GoAP) and the World Bank. The project development objective is to support urban reforms to improve city management and upgrade and expand municipal services through provision of physical infrastructure with particular focus on reducing urban poverty. The MA&UD is committed to address the social and environmental impacts that would arise due to the infrastructure developmental interventions under this project.

Environmental Component of the Project:

One of the critical components of the project is environment. Any adverse environmental impacts that would arise because of the proposed infrastructural development during construction and operation of the subprojects/subproject investments will be addressed through the structured systematic environmental management of subprojects. The important step of the environmental management is environmental assessment of subprojects with adverse impacts.

Environmental Assessment of Subprojects:

The environmental assessment of subprojects shall be assigned to consultants with environmental expertise and appropriate technology necessary for assessment. The assessment would be assigned to the consultants in conformity with this Terms of Reference that details the scope of work, Key deliverables, outputs and time frame.

Scope of the Assignment:

Environmental assessment is required for “EA” and “EB” categorized subproject investments, classified as per the categorization provided with the Environmental manual for ULBs / SEMF. Detailed environmental assessment is required for “EA” categorized subprojects and a status report with EMP is required for “EB” categorized subprojects. The scope of the assignment provides the minimum requirement criteria necessary for the environmental assessment and may require including additional activities. The comprehensive requirements change from one subproject to the other depending on the subproject specific issues and micro & macro environmental baseline.

1. All the ‘EA’ categorized sub-projects must and should undergo the “Detailed Environmental Assessment” and all the ‘EB’ subprojects shall undergo limited assessment with EMP, as per the below mentioned guidelines.
2. If a sub-project intervenes with an environmentally sensitive location/site/structure, such investments shall undergo detailed environmental assessment irrespective of their categorization.

Environmental Baseline Data

3. Environmental baseline data of the proposed sub-project intervention area to be collected. Document 6 –“Format for Data Collection” may be referred for procuring the baseline information.
 4. Environmental baseline information needs to be collected for areas falling outside the sub-project intervention area if they are likely to face adverse environmental impacts due to the sub-project intervention.
 5. As part of the data collection, required maps (topographical / contour / infrastructure service lines / habitat cover of flora and fauna / environmental sensitive locations etc.) that may likely to be affected due to sub-project intervention should be prepared for detailed assessment.
 6. Public consultations in the sub-project intervention area with key stakeholders should be used to highlight the problems faced and likely impacts due to the sub-project intervention.
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7. The data should also consist of
 - ➔ The size of the sub-project in terms of budget, area, estimated time of completion
 - ➔ The location of the sub-project and its intervention with environmentally sensitive locations
 - ➔ Number of beneficiaries and affected persons / families
 - ➔ Present infrastructure facilities like water distribution, sewage, storm water drains, street lights etc. and their maximum carrying capacities (quantity / volume) that would be affected due to sub-project intervention.
8. To describe the existing and anticipated changes in the physical, biological and socio-cultural environments including inter related impacts within and between the physical, biological and socio-economic environments (both positive and negative), due to the subproject intervention.

Environmental Legislations, Policies and Administrative Framework

9. “Document 10 – Environmental Legislations and Policies” be referred to assess compatibility with the environmental legislative and policy framework. For example, intervention of sub-project alignment with the coastal regulation area is within the framework of CRZ regulations of 1991.
10. Applicability to each subproject investment, applicability of all the laws in the above referred document should be determined. Verify applicability of all the prevailing national, state and local laws related to urban environment, cultural properties, environmentally sensitive areas, conservation, etc. (not covered in Document 4, if any) to the subproject investments.
11. To assist ULBs/PIAs in the clearances/approvals that are required to take up the subprojects.

Impact Analysis

12. Identify, analyze and evaluate various kinds of impacts, both positive and negative, in each of the following:
 - Direct and indirect impacts,
 - Duration of impacts,
 - Intensity of impacts – severity,
 - Magnitude of impacts – area, etc.
13. Special emphasis should be given to the impact analysis on environmentally sensitive locations.
14. Impacts can be identified by comparing the existing baseline and various components of the proposed sub-project like alignment, size, disturbance to existing civic services etc.
15. Overlay the forecasted adverse impacts due to the proposed sub-project on the existing baseline. A graph with environmental parameters on X-axis and existing and forecasted impacts on the Y-axis is suggested. This will bring to light quantitatively and qualitatively, the intensity and area of impact.
16. In addition, Public consultations may inform the implementing agency, whether all the impacts have been accounted for, as well as provide a bottom-up perspective on environmental hazards and management.

Analysis of Alternatives

17. All the available alternatives (including the proposed investment) for the alignments, locations, technology, construction techniques, phasing, O&M, etc. with respect to environmental impacts may be identified and analyzed to address the potential negative impacts and enhance the positive impacts, wherever possible. No project alternative (what would be the scenario of existing environmental baseline, projected in to future, if the subproject is not taken up) should also be analyzed.
18. Suitable alternatives within the proposal and alternatives for the proposal (if required) should be determined with appropriate analysis, reasoning and justification.

Suggestive / Mitigative and Monitoring Measures

19. Suggest suitable, financially feasible mitigation measures to reduce the adverse impacts to acceptable levels (Refer Document 7 key environmental standards) and enhance the positive impacts. Financial estimations for the suggested mitigation and monitoring measures shall be prepared.
 20. Refer to “Document 11 & 12 - Environmental Management Plan and Environmental Monitoring Plan”, to identify the suggestive measures for mitigation and monitoring of the impacts identified. Similar matrix is suggested for the preparation of EMP for each subproject.
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21. Finalize the measures to be taken for reducing/mitigating the adverse impacts and enhancing the positive impacts on air, water, land, flora & fauna, climate, soil etc. Ensure that the measures proposed pertain not only to the period of construction / implementation of the sub-project but also for subsequent operation & maintenance phase.

Public Consultations / public participation

The consultant in coordination with the ULB / Project Implementing Authority (PIA) should hold at least minimum required public consultations at the town level and / or at the subproject level as may be required. The following are the minimum required consultations at specified stages of the assessment. It is the responsibility of the consultants to see that the consultations are done with the involvement of ULB officials.

- If the subprojects' alignment is spread over a length and breadth of the major portion of the town, then a town wide consultation at the initiation of the assessment is required. If the investment interferes with a specific area, an initial consultation with the PAPs is a must. The consultation at this stage is to disclose to the public about the proposal and invite their major obligations, suggestions, etc. in taking up the subproject. As part of the environmental component, issues pertaining to any cultural property interventions, environmentally sensitive zones could be identified from the public. Major emphasis should be to build consensus of the PAPs.
 - The consultants, with the consensus of the ULB may involve NGOs, communities in the collection of environmental baseline data necessary for the assessment process. The requirement depend ion the size of the subproject, area of intervention. Focus group discussions, consultations are suggested as per the requirement for the environmental baseline data. Many times, the requirement of different parameters of the data is identified at the different stages of the subproject, as per the necessity.
 - The stakeholders – NGOs, Councilors and PAPs shall be contacted to identify, analyze and finalize the alternatives, as per the requirements and impacts.
 - Disclosure of EAR with EMP during the consultation and availability of the same should be made in the subproject location.
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Key Deliverables and Outputs:

The following key deliverables with the list of outputs are expected from the assessment exercise of the subprojects.

Key Deliverables	Outputs / Contents
Maps, Drawings, Engineering, Architectural Plans	<ul style="list-style-type: none"> ➤ Demarcated physical environment like contours, topographical details, surface water bodies, natural features, reserve forest areas, environmentally sensitive locations, cultural properties, etc. with readings, areas, slopes, quantities, volumes, etc. ➤ Biological environment like list of flora & fauna with the regions demarcated, etc. ➤ Physical infrastructure on, above and under the ground, like roads, drains, electric lines, transformers, settlements, etc. demarcated and mapped with details like length, width, depth, height, present volumes of the drains and maximum carrying capacity, present condition, etc.
Environmental Assessment report	<ul style="list-style-type: none"> ➤ Analysis of Environmental baseline data ➤ Applicable legislations, policies and administrative framework of national, state and local importance. ➤ Positive and negative Impact analysis ➤ Analysis of alternatives with change in impacts. ➤ Environmental management and monitoring plans during construction and operation.
Documentation of Public consultations - report	<ul style="list-style-type: none"> ➤ Number of public consultations held, minutes, major issues, photographs with dates, etc. ➤ A matrix with changed design due to consultations in one column and the original design in another. A third column should give the changed impacts due to consultations.
Final drawings with report	<ul style="list-style-type: none"> ➤ Final drawings annexed with original drawings highlighting alternatives incorporated like alignments, location, etc. ➤ The report should contain with a matrix, the original construction, material and technology specifications in one column and the alternatives finalized in another column. A third column should give the changed impacts due to selected alternatives.

Time Frame:

The consultants will produce the final deliverables referred above within 3 months from the date of contract agreement with the ULB/PIA. However, it may extend to a maximum limit of five months, if the subproject intervenes in a length more than 3 km.

DOCUMENT - 14

TERMS OF REFERENCE FOR A LIMITED ENVIRONMENTAL ASSESSMENT OF A LANDFILLING OPERATION

Introduction: Typically a landfill site selection process is followed by a detailed technical investigation for site characterization, detailed design and engineering, landfill construction, and preparation of plans for operations & maintenance, landfill closure, post closure monitoring system. The Limited Environmental Impact Assessment (LEIA) should cover all the environmental aspects of these subsequent next steps, so as to provide recommendations to mitigate environmental impacts through up-streaming of environmental plans at planning/design stage.

Background: This section should include a brief description of the project's broad purpose, project proponents, implementing institution, schedule of completion, regulatory needs, etc.

Statement of Objectives: Please describe general and specific objectives of the environmental and health impact assessment in relation to the project preparation activities such as feasibility studies (planning, design and implementation, operation and maintenance etc).

Study Area: This section should provide site description including boundaries of the study area for assessment. Typically the study should include environmental aspects related activities in the chain of solid waste management, namely, primary and secondary waste collection & storage, transportation, treatment and disposal. More specifically this would comprise all processes/activities associated with construction, operation, maintenance, closure and post closure of the proposed landfill. This section should also provide a brief description of communities likely to be affected, which may include areas downstream and downwind of the project site. The site description should be based on the results of site selection process and provide details such as site geography, site infrastructure, geology, geo-hydrology, neighboring land use, etc.

Project Description: This section should provide details of expected waste generation, storage, transportation, treatment plan including outline of landfill layout, progressive development of landfill operation, proposed leachate collection, surface and storm water management system.

Scope of Work

Baseline Data Generation:

The consultant shall make reasonable efforts to establish linkage with possible causes of degradation for those environmental attributes which represent a relatively degraded environmental condition through analysis of baseline data. Environmental components to be analyzed shall include but not limited to the following:

Description of the environment: providing baseline data on the relevant environmental characteristic of the study area focusing on:

- a) Physical environmental including description of the geology, topography, soil, climate and meteorology (wind speeds, directions, temperatures, rainfall etc with emphasis on critical season), ambient air quality, surface and ground water hydrology and quality, existing water quality status, rains and floods, recharge areas, noise, drainage, and significant landscapes to ensure suitability of location, compatibility tests to establish the long-term effect of waste on liner materials as well as other routine checks.
 - b) Biological environmental Forests areas, if any (density, diversity, flora, fauna etc), ecologically sensitive areas (sanctuaries, national parks, endangered species, wildlife etc), habitats, lakes, ponds,
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wetlands and other marshy habitats, location of significant grazing fields and water sources. This should also include an assessment of any health hazards, including general health status of local community, most common causes of morbidity and mortality, disease vector monitoring etc

- c) Social and Cultural environmental covering aspects like population distribution, land use, community structure, employment, distribution of income, health conditions, civic amenities land tenure, existing settlement, infrastructure and services, public health and employment. The baseline survey should also include identification of key stakeholders, who would benefit (and or adversely affected) from the investments including tribal communities if any; and people (both as individuals and as communities) who are likely to be adversely affected by the project, including tribal,
- d) Archaeological and historical sites of significance covering historic remains, including monuments and other ancient structures if any.

In addition to the above indicative attributes, the consultant shall use professional judgment and local knowledge in further defining the data requirements to establish proper baseline environmental status of the study region.

Identification, Prediction and Evaluation of Impacts:

Prediction of Environmental Impacts: The consultant shall analyze the project and its activities (ranging from construction to post closure of landfill facility) to determine the additional environmental pressure/load that the project might exert on the existing environment and predict the level of their manifestations on various environmental components/attributes. For the purpose of prediction of incremental change in environmental quality, the consultant shall use acceptable predictive models wherever available. As a part of the impact prediction, the consultant shall also provide an adequate discussion of the following aspects:

- Use of relevant prediction models to quantify the pollution due to the project especially during operational and post closure phase of the project in the study region and adequate discussion of approach/methodology/tools/techniques/models used for prediction of impacts
- The extent and quality of available data, key data gaps and uncertainties associated with predictions
- The environmental aspects which are not relevant and do not require prediction/assessment in the project cycle should be specified and discussed adequately.

Evaluation of Impacts: The consultant shall, in the EA report, evaluate significance of all environmental impacts having positive and negative, short term and long term, direct and indirect, beneficial and adverse impact categories associated with different stages of the project implementation. This should also include prediction of the magnitude of these possible impacts on the environment, evaluation of the net impact of the proposed activities on air, water and land environmental and on human interface at the project site. The assessment methodology should be based on data analysis of primary field data and secondary data sources, against pre-defined criteria, and transposing scores into ranges describing the degree of positive or negative impacts. Impacts, if any, that are irreversible and/or cannot be avoided or mitigated should be identified and discussed adequately. The resulting environmental quality after due consideration of the incremental change due to the project shall be analyzed against the applicable regulatory standards where applicable. The impacts shall be evaluated based on their magnitude, frequency and duration using acceptable techniques as may be relevant.

Preparation of Environmental Management and Monitoring Plan:

The Consultant will develop a detailed environmental management plans to mitigate or minimize the negative impacts, which will address the positive and negative environmental impacts of projects, respective enhancement and mitigation measures, associated costs, institutional responsibilities, monitoring, evaluation and training and lay down procedures for environmental and social audit. This would include measures to minimize or eliminate negative consequences including "non project" option. Typically the management plan should include the following broader elements:

- a) *Transportation Plan:* Alternative route plan for transportation of solid waste to secondary collection point and treatment/disposal site. Various advanced optimization techniques such as the transportation model, shortest route algorithm and minimal spanning tree model should be used so as to reduce transportation and operation cost and also for eradication of environmental damage. The consultant should construct a network of collection and delivery points using the various maps of the areas.
 - b) *Mitigation Plan:* The recommendations, including mitigation and enhancement measures, should be based on good engineering in order to mitigate any potential contamination of surface water, ground water, soil, flora, fauna and odor. Mitigation measures would include codes of practice describing both technical options and appropriate management practices as may be applicable
 - c) *Institutional arrangements:* This section should provide details of organizational structure including definition of roles and responsibilities to ensure effective planning and implementation of mitigation measures.
 - d) *Monitoring, Auditing and Supervision Plan:* This section should include plans for monitoring of environmental quality of the surrounding area during construction and operational phase of the project. This will comprise performance indicators to monitor, audit, evaluate and supervise negative and positive project environmental impacts including those that would allow benchmarking of solid waste management aspects against its own performance. A monitoring plan should address frequency and methodology of monitoring as well as allocate institutional responsibility and costs.
 - e) *A training and capacity building plan:* One of the main outputs should be an institutional plan for improving solid waste management capacity of the implementing agency. For this the consultant should prepare implementation plan including training of existing staff and other agencies involved in implementation.
 - f) *Resource and responsibility allocation for EMP implementation:* The cost (capital and recurring) associated with implementation of all the mitigation measures highlighted in the EMP and the responsible parties should be clearly identified. Wherever possible the measures should be drafted as contract clauses which can be incorporated in construction/operational phase agreements.
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DOCUMENT – 15

CULTURAL PROPERTY MANAGEMENT PLAN

All the sub project investments that intervene with cultural properties shall be categorized as “EA” - that are environmentally sensitive and have severe adverse environmental/cultural impacts - and should undergo a Detailed Environmental Assessment that includes a *Cultural Property Management Plan*.

Definition of Cultural Property

The term Cultural Property refers to “*the sites and monuments / constructions with archeological (prehistoric), paleontological, historical, religious, and unique natural values*”.

Cultural properties are heritage structures that reflect the history of a region and cultural practices of the people. They encompass the remains of previous human inhabitants (for example, middens, shrines, and battlegrounds) and unique natural environmental features such as canyons and waterfalls. Most importantly, they are the sources of historical and scientific information. Since the rapid loss of cultural property is irreversible, it is to be mandated to protect the cultural properties.

Cultural Property Policy Guidelines

The principal policy guideline of the Project is to protect and conserve the Cultural Properties. It would aim to avoid the elimination, demolition or damage to any cultural property.

1. Any project or sub-project that could considerably damage or mandates demolition of any cultural property should not be sanctioned for commissioning.
 2. If any sub-project investment intervenes with the damage to cultural property, which is not minor, then the project-implementing agency should work out alternatives to the proposed investment.
 3. If the sub-project investment is in great favor and may generate major benefits to the people, and if it poses minimum damage to any cultural property, and if there is no other alternative to the proposed investment, justified by the competent authorities, then
 - ➔ People’s opinion survey, public consultation and focused group discussions with the sub-project affected people surrounding the cultural property to be conducted
 - ➔ The Archeological department should be consulted for its active role and clearance of the sub-project
 - ➔ Architects/conservation specialists should be involved for possible alternatives that eliminates/mitigates the damage to the cultural property.
 4. In cases where the investment can neither be relocated nor cancelled, and which is of great benefit to the society, the cultural structures may be restored, relocated, preserved on alternate sites in consultation with the conservationists, archeologists and architects.
 5. The implementing and monitoring institution should be strengthened and trained to be entrusted with safeguarding cultural properties.
 6. The finances for the cultural property management should be directly part of the scope of the project.
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DOCUMENT – 16

PESTICIDE MANAGEMENT

Governments have the overall responsibility to regulate the availability, distribution and usage of pesticides while implementing sub-projects. This can be done through Integrated Pest Management (IPM) and/or Integrated Vector Management (IVM) methodologies, which require the implementation of investigative efforts to define the problem and use of non-chemical methodologies and actions well before implementing a sub-project. Both the methodologies advocate on controlling the usage of chemicals and pesticides during implementation that may prove to be hazardous to the health of the people.

In the event that the sub-project requires the use of chemical control methods including pesticides, it should present evidence of the need, describe the economic significance and proposed compound use and protective measures that will be put into place to protect users and non-targeted populations.

The World Health Organization (WHO) has listed and categorised such dangerous and hazardous pesticides. Under the APURMSP distribution or use of such pesticides should be prohibited keeping in view the dangerous affects such chemicals and pesticides have on the people and their surrounding environment. The WHO's categorization of hazardous chemicals and pesticides is as follows:

1. Extremely hazardous
2. Highly hazardous
3. Moderately hazardous and
4. Slightly Hazardous

Hence the project implementing agencies under the project should ensure that they employ best environmental practices and best available techniques in order to minimize unintentional releases of hazardous chemical pesticides. To ensure this the MAUD should also ensure:

- Proper training and capacity building of the ULBs to identify and restrain the use of such chemicals.
- Provide technical assistance ULBs, especially to those ULBs lacking technical expertise in the assessment of the relevant data on pesticides
- Provision of equipment and proper facilities to handle, store and apply safety measures in curtailing the use of such chemicals and ensure proper pesticide management.
- Store and dispose of obsolete hazardous chemical pesticides in an environmentally sound manner
- Special attention to the choice of pesticide formulations used to reduce risks to users and minimize adverse effects on the environment etc.

To ensure that the affects of any usage of pesticides is to be reduced proper mitigation measures are to be followed. For this purpose the project-implementing agency should:

- Periodically review the pesticides used, their acceptable uses and their availability to each sector of the public, and conduct special reviews when indicated by scientific evidence
 - Carry out health surveillance programmes of those who are occupationally exposed to such pesticides and investigate
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- Provide guidance and instructions to municipal health workers, physicians and hospital staff on the treatment of suspected pesticide poisoning
- Utilize all possible means for collecting reliable data and maintaining statistics on health aspects of pesticides and pesticide poisoning incidents
- Suitably trained personnel and adequate resources should be made available to ensure the accuracy of information collected
- Provide extension and advisory services to all the stakeholders involved in implementation like contractors, community, municipal staff etc., and also with adequate information about practical strategies and methods of curbing pesticide usage
- Adopt engineering standards and operating practices appropriate to the nature of the work and the hazards involved, and also ensure the availability of appropriate protective equipment;
- Take all necessary precautions to protect workers, bystanders, surrounding communities and the environment
- Maintain quality-assurance procedures to ensure compliance with the relevant standards of purity, performance, stability and safety

For detailed information on pesticide management refer to the two documents shown in the box, which will guide the implementation staff in the ULBs and also to devise appropriate chemical control plans and strategies.

1. ***The WHO Recommended Classification of Pesticides by hazard and guidelines to Classification***, International Programme on Chemical Safety (IPCS), 2004
2. ***International Code of Conduct on the Distribution and Use of Pesticides***, adopted by the Hundred and twenty – third Session of the FAO Council in November 2002, Food and Agriculture Organization of the United Nations, Rome, 2003