Draft Initial Environmental Examination

August 2014

IND: Rajasthan Urban Sector Development Program – Water Supply and Sewerage in Tonk

Prepared by Rajasthan Urban Infrastructure Development Project, Government of Rajasthan for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 8 July 2014)

Currency unit	–	rupee (INR)
INR1.00	=	$0.016
$1.00	=	INR 60.3395

ABBREVIATIONS

ADB	–	Asian Development Bank
AC	–	Asbestos Cement
AE	–	Assistant Engineer
ADB	–	Asian Development Bank
ASI	–	Archeological Survey of India
ASO	–	Assistant Safeguards Officer
CAPC	–	Community Awareness and Participation Consultant
CFE	–	Consent for Establishment
CFO	–	Consent for Operation
CETP	–	Common Effluent Treatment Plant
CPCB		Central Pollution Control Board
EA	–	Executing Agency
EAC	–	Expert Appraisal Committee
EC	–	Environmental Clearance
EHS	–	Environmental Health & Safety
EIA	–	Environmental Impact Assessment
SEIAA	–	State Environmental Impact Assessment Authority
EMP	–	Environmental Management Plan;
GOI	–	Government of India
GOR	–	Government of Rajasthan
IA	–	Implementing Agency
IEE	–	Initial Environmental Examination;
PIU	–	Project Implementation Unit;
PMU	–	Project Management Unit
LSGD	–	Local Self Government Department
MOEF	–	Ministry of Environment and Forest
MLD	–	Million Liters per Day
LPCD	–	Liters per Capita per Day
ELSR	–	Elevated Service Reservoir
PE	–	Polyethylene
DWC	–	Double Corrugated Duct
NHAI	–	National Highways Authority of India
NOC	–	No Objection Certificate
PHED	–	Public Health Engineering Department
PO	–	Project Officer
PMDSC	–	Project Management, Design and Supervision Consultant
PPTA	–	Project Preparatory Technical Assistance
PWD	–	Public Works Department
REA	–	Rapid Environmental Assessment Checklist
SBR	–	Sequential Batch Reactor
RoW	–	Right of Way
RPCB	–	Rajasthan Pollution Control Board

RUIDP	–	Rajasthan Urban Infrastructure Development Project
RUSDP	–	Rajasthan Urban Sector Development Program
SPS	–	Safeguard Policy Statement, 2009
STP	–	Sewage Treatment Plant
TNP	–	Tonk Nagar Parishad
ULB	–	Urban Local Body
WTP	–	Water Treatment Plant

WEIGHTS AND MEASURES

°C	Degree Celsius
km	kilometre
lpcd	litres per capita per day
mm	milli meter
m	metre
MLD	million litres per day
mm	millimetre
Nos	Numbers
Sq.km	Square Kilometer

NOTE{S}

In this report, "$" refers to US dollars.
“INR” and “₹” refer to Indian rupees

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EXECUTIVE SUMMARY

1. The proposed Rajasthan Urban Sector Development Program (RUSDP) will complement the past and ongoing efforts of Government of Rajasthan (GoR) to improve water supply and wastewater services to the residents of the state of Rajasthan. The program component of the RUSDP will support policy reforms and consolidate institutional development and governance improvement in the urban sector in the state, while the investment component of the RUSDP will invest in water distribution network improvements and sewerage systems in the six project cities[1] each having a population of more than 100,000, and identified considering the lack of basic services at present and willingness to undertake reforms and institutional restructuring. RUSDP will be implemented over a 5-year period beginning in March 2015, and will be funded by ADB via a Sector Development Program (SDP) loan modality.

2. Tonk water supply and sewerage subproject is one of the subprojects proposed under the RUSDP. Water supply at present in Tonk is intermittent, unreliable and suffers with huge losses and quality issues. There is no sewerage system in the town. Most of the households depend on septic tanks for disposal of sewage. Effluent from septic tanks and sullage is let off into open drains which ultimately discharge into River Banas. ADB requires consideration of environmental issues in all aspects of the Bank's operations, and the requirements for Environmental Assessment are described in ADB's SPS (2009). This Initial Environmental Examination (IEE) addresses the infrastructure components proposed under Tonk water supply and sewerage subproject.

3. **Categorization.** Tonk water supply and sewerage subproject is classified as Environmental Category B as per the SPS as no significant impacts are envisaged. Accordingly, this Initial Environmental Examination (IEE) assesses the environmental impacts and provides mitigation and monitoring measures to ensure that there are no significant impacts as a result of the project.

4. **Project Scope.** The subproject is formulated to address gaps in water and sewerage infrastructure in a holistic and integrated manner. The main objective of the RUSDP is to improve water efficiency, security, and provide safe sewage collection, treatment and disposal system, and will have an important effect on public health and environment. Investments under this subproject include (i) distribution network improvement (141 km new pipelines and 248 km replacement); (ii) provision of bulk water meters (ii) provision of house service connections including consumer meters; (iv) laying new sewers (254 km); (v) provision of sewer connections to houses and (vi) sewage treatment plant (13 MLD, capacity sequential batch reactor based).

5. **Implementation Arrangements.** The Local Self Government Department (LSGD) of Government of Rajasthan will be the Executing Agency (EA) and existing RUIDP will be the Implementing Agency (IA). The LSGD will be responsible for overall strategic planning, guidance and management of the RUSDP, and for ensuring compliance with tranche release conditions and loan covenants. A policy support unit will be established in the LSGD to support the government for implementation of the tranche release policy actions under the program loan. The RUIDP will be responsible for planning, implementation, monitoring and supervision, and coordination of all activities under the RUSDP. The RUIDP will recruit two consulting firms – (i) project management, design and supervision consultant (PMDSC), and (ii) community awareness and participation consultant (CAPC) to provide support in implementation of RUSDP. Six Project Implementation Units (PIUs), one each of in six project towns, shall be set

[1] Pali, Tonk, Ganganagar, Jhunjhunu, Bhilwara and Hanumangarh.

up directly to assist in implementation. PMU will support PIUs in implementation, management and monitoring of the project. PMU and PIUs will be assisted by PMDSC and CAPC. PIUs will appoint construction contractors to build infrastructure. Once the infrastructure is built and commissioned, the Urban Local Bodies will operate and maintain the infrastructure. Project Officer (Environment) at PMU and Assistant Safeguard Officer (ASO) at each of the PIUs will be responsible for environment management and monitoring activities, and will be supported by Environment Safeguard Specialist of PMDSC Team. Contractor personnel will include an Environment, Health and Safety (EHS) supervisor.

6. **Description of the Environment.** Subproject components are located in Tonk Town in its immediate surroundings which were converted into urban use for many years ago, and there is no natural habitat left at these sites. The project sites are located in existing road right of way (RoW) and government-owned lands. There are no protected areas, wetlands, mangroves, or estuaries in or near the project locations. Soils are deep, and do not require cutting of rocks for pipe laying. The site proposed for construction of Sewage Treatment Plant (STP) is located at about 5 km east of the town, and is ideally away from inhabited areas. Site is currently vacant; there is no notable tree cover, and vegetation is limited to shrubs and bushes. There are no environmentally sensitive areas, and the treated wastewater will be used for irrigation in the fields surrounding the site.

7. **Environmental Management.** An environmental management plan (EMP) is included as part of this IEE, which includes (i) mitigation measures for environmental impacts during implementation; (ii) an environmental monitoring program, and the responsible entities for mitigating, monitoring, and reporting; (iii) public consultation and information disclosure; and (iv) a grievance redress mechanism. A number of impacts and their significance have already been reduced by amending the designs. The construction phase EMP will be included in civil work bidding and contract documents.

8. Locations and siting of the proposed infrastructures were considered to further reduce impacts. These include (i) locating facilities on government-owned land to avoid the need for land acquisition and relocation of people; and (ii) laying of pipes in RoW alongside main/access roads, to reduce acquisition of land and impacts on livelihoods specifically in densely populated areas of the town.

9. Potential impacts were identified in relation to location, design, construction and operation of the improved infrastructure. During the construction phase, impacts mainly arise from the need to dispose of moderate quantities of waste soil and disturbance of residents, businesses, and traffic. These are common temporary impacts of construction in urban areas, and there are well developed methods for their mitigation. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. Resettlement Plan prepared for the Tonk Subproject addresses temporary resettlement/livelihood issues resulting mainly from laying of sewer/pipelines in busy commercial areas.

10. Measures such as appropriate scheduling of works (non-monsoon season, low traffic hours, etc.,) and minimizing inconvenience by best construction methods will be employed. Traffic management plan will be prepared for pipe/sewer-laying works on busy roads. In the operational phase, all facilities and infrastructure will operate with routine maintenance, which should not affect the environment. Facilities will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only. Appropriate design and operation measures will be put

in place at STP to ensure adequate treatment efficiency for both wastewater and sludge. Measures are included to prevent industrial discharges into sewers.

11. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. Mitigation will be assured by a program of environmental monitoring to be conducted during construction. The environmental monitoring program will ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. Any requirements for corrective action will be reported to the ADB.

12. The stakeholders were involved in developing the IEE through discussions on-site and public consultation, after which views expressed were incorporated into the IEE and in the planning and development of the project. The IEE will be made available at public locations in the city and will be disclosed to a wider audience via the ADB, RUIDP and PMU websites. The consultation process will be continued and expanded during project implementation to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation.

13. The citizens of the Tonk town will be the major beneficiaries of this subproject. With the improved water supply, they will be provided with a constant supply of better quality water, piped into their homes. The sewerage system will remove the human waste from their homes safely and quickly. In addition to improved environmental conditions, the project will improve the over-all health condition of the town. People would spend less on healthcare and lose fewer working days due to illness, so their economic status should also improve, as well as their overall health.

14. **Consultation, Disclosure and Grievance Redress.** Public consultations were done in the preparation of the project and IEE. Consultations will continue throughout the project implementation period with the assistance of the NGOs. A grievance redress mechanism is described within the IEE to ensure any public grievances are addressed quickly.

15. **Monitoring and Reporting.** The PMU and PMDS consultants will be responsible for monitoring. The PMDSC will submit monthly/semi-annual monitoring reports to PMU, and the PMU will review and send the semi-annual monitoring reports to ADB. ADB will post the environmental monitoring reports on its website.

16. **Conclusions and Recommendations.** The proposed project is therefore unlikely to cause significant adverse impacts. The potential impacts that are associated with design, construction and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Based on the findings of the IEE, there are no significant impacts and the classification of the project as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009) or GoI EIA Notification (2006).

I. INTRODUCTION

A. Background

1. **Project background and context**. The proposed Rajasthan Urban Sector Development Program (RUSDP) will complement the past and ongoing efforts of Government of Rajasthan (GoR) to improve water supply and wastewater services to the residents of the state of Rajasthan. The program component of the RUSDP will support policy reforms and consolidate institutional development and governance improvement in the urban sector in the state, while the investment component of the RUSDP will invest in water distribution network improvements and sewerage systems in the six project cities[2] each having a population of more than 100,000, and identified considering the lack of basic services at present and willingness to undertake reforms and institutional restructuring. RUSDP will be implemented over a 5-year period beginning in March 2015, and will be funded by ADB via a Sector Development Program (SDP) loan modality. The expected impact of the RUSDP will be sustainable urban development in Rajasthan. The expected outcome will be improved urban service delivery in Rajasthan. RUSDP will have five outputs, out of which Outputs 1 and 2 will be supported by the program component, while Outputs 3, 4 and 5 will be supported by the investment component.

2. The focus of the RUSDP investment will be on water supply and sewerage infrastructure. A series of subprojects will be implemented under the Project, with each subproject providing improvements to water supply or sewerage or both in a project town.

B. Background of IEE

3. Tonk Town water supply and sewerage subproject is one of the subprojects proposed in RUSDP. Water supply is currently intermittent, and suffers with huge losses and quality issues. ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for environmental assessment are described in ADB's Safeguards Policy Statement (2009). Accordingly, this Initial Environmental Examination (IEE) has been conducted to assess the environmental impacts and provide mitigation and monitoring measures to ensure that there are no significant impacts as a result of the subproject.

C. Environmental Regulatory Compliance

4. Table 1 presents a summary of environmental regulations and mandatory requirements applicable to Tonk Town water supply and sewerage subproject.

Table 1: Applicable Environmental Regulations

Law	Description	Requirement
EIA Notification	The EIA Notification of 2006 set out the requirement for environmental assessment in India. Environmental Clearance is required for certain defined activities/projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B depending on the scale of the project and the nature of its	Project is not a listed activity in Schedule I of this notification and hence environmental clearance is not required.

[2] Pali, Tonk, Ganganagar, Jhunjhunu, Bhilwara and Hanumangarh.

Law	Description	Requirement
	impacts. Category A projects require Environmental Clearance from the Ministry of Environment and Forest (MoEF). Category B projects require Environmental Clearance from the State Environmental Impact Assessment Authority (SEIAA).	
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments	Act was enacted to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, by Central and State Pollution Control Boards and for conferring on and assigning to CPCB/SPCBs powers and functions relating to water pollution control. Control of water pollution is achieved through administering conditions imposed in consent issued under provision of the Water (Prevention and Control of Pollution) Act of 1974. These conditions regulate the quantity and quantity of effluent, the location of discharge and the frequency of monitoring of effluents. Any component of the subproject having the potential to generate sewage or trade effluent will come under its purview. Such projects have to obtain Consent For Establish (CFE) under Section 25 of the Act from Rajasthan Pollution Control Board (RPCB) before starting implementation and Consent For Operate (CFO) before commissioning.	Sewage treatment plant (STP) requires CFE and CFO from RPCB. All relevant forms, prescribed fees and procedures to obtain the CFE and CFO can be found in the RPCB website (www.rpcb.gov.in).
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	This Act was enacted to achieve prevention, control and abatement of air pollution activities by assigning regulatory powers to Central and State boards for all such functions. The Act also establishes ambient air quality standards The projects having potential to emit air pollutants into the atmosphere have to obtain CFE and CFO under Section 21 of the Act from RPCB The occupier of the project/facility has the responsibility to adopt necessary air pollution control measures for abating air pollution.	STP also requires CFE and CFO under the Air Act. A combined application form (for both Water Act and Air Act) shall be submitted to RPCB. The following will also require CFE and CFO from RPCB: (i) diesel generators; (ii) hot mix plants; and (iii) stone crushers, if installed for construction. All relevant forms, prescribed fees and procedures to obtain the CFE and CFO can be found in the RPCB website (www.rpcb.gov.in).
Environment (Protection) Act, 1986 and CPCB Environmental Standards.	Emissions and discharges from the facilities to be created or refurbished or augmented shall comply with the notified standards	**Appendix 2** provides applicable standards for ambient air quality.
Noise Pollution (Regulation and	Rule 3 of the Act specifies ambient air quality standards in respect of noise for different	**Appendix 3** provides applicable noise standards.

Law	Description	Requirement
Control) Rules, 2000 amended up to 2010.	areas/zones.	
Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010	The Act designates areas within 100 meters (m) of the "protected monument/area" as "prohibited area" and beyond that up to 200 m as "regulated area" respectively. No "construction" is permitted in the "prohibited area" and any construction activity in the "regulated area" requires prior permission of the Archaeological Survey of India (ASI).	There are no ASI protected monuments/sites Tonk. However, in case of chance finds, the contractors/PIU will be required to follow a protocol as defined in the Environmental Management Plan (EMP).
Rajasthan State Environment Policy, 2010 including And Rajasthan Environment Mission and Climate Change Agenda for Rajasthan (2010-14)	Follows the National Environment Policy, 2006 and core objectives and policies are: - Conserve and enhance environmental resources; assure environmental sustainability of key economic sectors; and, improve environmental governance and capacity building - it recommends specific strategies and actions to address the key environmental issues: water resources, desertification and land degradation, forest and biodiversity, air quality, climate change: adoption and mitigation, mining, industry, tourism, energy, urban development, etc. - Establishment of Environment Mission under the chairpersonship of the Chief Minister and a Steering Committee under the chairpersonship of Chief Secretary, Government of Rajasthan Tasks force set up for six key areas	- Project implementation should adhere to the policy aims of: conservation & enhancement of environmental resources, integration of environmental concerns into projects/plans, and capacity building in environmental management - under water sector, major concerns, as the policy notes, are: huge water losses & wastage, declining water availability, pollution - Relevant recommendations for the project include: control of losses, integrated water resources management, control of raw water pollution, reuse and recycling -avoid/minimize use of forest lands With reference to Climate change adoption & mitigation following should be considered in the project: - diminishing flows in surface water bodies, and groundwater depletion, and revival traditional water bodies as water sources (lakes/tanks) - equal stress on demand side management in water -minimize energy use - design energy efficiency systems-
The Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961; the Rajasthan Monuments, Archaeological Sites and Antiquities (amendment) Act	Any construction/excavation work in the 'protected area' (as declared by GoR under the Act) requires priori permission of Department of Archeology & Museums -Application under the Rules shall be submitted to Director, State Archeological Department, at least 3 months prior to the work. Department provides conditional permission, including time for completion,	Sunehri Kothi is a State Protected monument notified by GoR under this Act. No works are proposed in the protected area, therefore no permission is required. However, in case of chance finds, the contractor/PIU will be required to follow a protocol as

Law	Description	Requirement
2007	procedures to be followed during the work and for chance finds etc.	defined in the Environmental Management Plan (EMP).
The Right to fair compensation and transparency in land acquisition, rehabilitation and resettlement Act, 2013	Private land acquisition is guided by the provisions and procedures of this Act.	Not applicable to this subproject as there is no private land acquisition or resettlement
Labor Laws	The contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements. The contractor shall base the employment relationship upon equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment or retirement, and discipline. The contractor shall provide equal wages and benefits to men and women for work of equal value or type.	**Appendix 7** provides applicable labor laws including amendments issued from time to time applicable to establishments engaged in construction of civil works.
Biodiversity Act of 2002	The Biodiversity Act 2002 primarily addresses access to genetic resources and associated knowledge by foreign individuals, institutions or companies, to ensure equitable sharing of benefits arising out of the use of these resources and knowledge to the country and the people.	Not applicable to Tonk water supply and sewerage subproject
Ramsar Convention, 1971	The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources. India is one of the signatories to the treaty. The Ramsar convention made it mandatory for the signatory countries to include wetland conservation in their national land use plans.	There are no Ramsar sites in Tonk. Not applicable to Tonk water supply and sewerage subproject
Wildlife Protection Act, 1972	This overarching Act provides protection to wild animals, birds, plants and matters connected with habitat protection, processes to declare protected areas, regulation of wildlife trade, constitution of state and national board for wildlife, zoo authority, tiger conservation authority, penalty clauses and other important regulations.	Not applicable to Tonk water supply and sewerage subproject
Forest (Conservation) Act, 1980	The Forest (Conservation) Act prohibits the use of forest land for non-forest purposes without the approval of Ministry of Environment and Forests (MoEF), Government of India	Not applicable to Tonk water supply and sewerage subproject
Rajasthan Forest	This Act makes the basis for declaration of	Not applicable to Tonk water

Law	Description	Requirement
Act, 1953 and Rajasthan Forest Rules, 1962	Reserved Forests, constitution of village forest committees, management of reserved forests and penalties and procedures.	supply & sewerage subproject

5. The ADB guidelines stipulate addressing environmental concerns, if any, of a proposed activity in the initial stages of project preparation. For this, the ADB SPS categorizes the proposed projects into various categories (A, B or C) to determine the level of environmental assessment required to address the potential impacts. Level of environmental assessment required for each category is presented below.

(i) **Category A:** Projects with potential for significant adverse environmental impacts. An Environmental Impact Assessment (EIA) is required to address significant impacts.
(ii) **Category B:** Projects likely to have some adverse environmental impacts, but of lesser degree and/or significance than those for Category A. An initial environmental examination (IEE) is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
(iii) **Category C:** Projects unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are still reviewed.

6. The environmental impacts of Tonk water supply and sewerage subproject have been identified and assessed as part of the planning and design process. An environmental assessment using ADB's Rapid Environmental Assessment Checklist for Water Supply and Sewerage (**Appendix 1**) was conducted, and results of the assessment show that the subproject is unlikely to cause significant adverse impacts. Thus, this IEE has been prepared in accordance with ADB SPS's requirements for environment category B projects.

D. Scope of IEE

7. The IEE was based mainly on secondary sources of information and field reconnaissance surveys; no field monitoring (environmental) survey was conducted. Stakeholder consultation was an integral part of the IEE.

E. Report Structure

8. This Report contains nine (9) sections: (i) Executive summary; (ii) Introduction and regulatory framework (iii) Description of the project (iv) description of the environment; (v) Anticipated environmental impacts and mitigation measures; (vi) public consultation and information disclosure; (vii) Grievance redress mechanism; (viii) Environmental management plan, and, (ix) Conclusion and recommendation.

II. DESCRIPTION OF THE PROJECT

9. Tonk is the headquarter of Tonk District, and is situated in the south eastern part of Rajasthan State. It is located at about 100 km south of State Capital, Jaipur. Tonk is one of the six project towns selected for implementation of the ADB funded Rajasthan Urban Sector Development Program (RUSDP).

A. Present Situation

10. **Water Supply**. At present, the Tonk town meets the water demand from 24 open wells sunk in Banas river bed and 42 tube wells at various locations in the town. Total water abstracted from underground source is 5 MLD. Since 2010, 8 MLD of water is being provided from Bisalpur Dam (total allocation for Tonk is 60 MLD). Water is tapped from a pipeline at Nethri head works, near the town. However due to lack of storage facilities to collect the water from head works, the supply has not been effective. The facilities to effective utilize Bisalpur water is presently under construction.

11. The water from bore wells is distributed without treatment except chlorination. Total storage capacity of 5.34 Ml, which is less than 33% of the demand. Distribution network of 252.80 km with 16,700 house service connections exist in the city. Treated surface water from Nathri head works is collected in clear water reservoirs (CWRs) at Bahi and pumped to zonal elevated service reservoirs (ELSRs) for distribution by gravity.

12. Till year 2009 water supplied at 24 hour interval. Daily average production of water from local sources, situated at Banas River was 8 to 10 MLD. Production of water had been reduced during summer periods every year. Every year, 1.0 TMC of water is released into River Banas from Bisalpur Dam in the month of May to recharge ground water sources, situated along Banas River. Water supply interval was converted to 48 hours in March 2010 due to low production of water. The average water table in Tonk block is 11.98 m. The average fluctuation in ground water table ranges from 10.25 to 14.83 m in post monsoon to 13.70 to 15.50 m in pre-monsoon. The overall water table is depleting and it has gone down by 9.17 m during the period 1984 - 2008. The quality of groundwater is not good. The newly developing outer areas of the town do not have water supply system.

13. While gross water supply rate is over 78 litres per capita per day (LPCD), the water provided at consumer end is about 48 LPCD only, which is less than standard of 135 LPCD. This is due to heavy losses in the existing distribution network – a rough estimate during the project preparation indicates water losses (physical leakage) in the range of 20-26%, while total non-revenue water is 41%. The water transmission and distribution network is old, profusely leaking and is badly in need of rehabilitation and replacement.

14. **Sewerage.** There is no sewerage system is in place in Tonk. The sewage and sullage are being let into the open drains or on ground, which pollutes the environment and contaminates the ground water. Open defecation is not uncommon. Most of the residential and commercial buildings and educational institutions have on-site septic tanks and soak pits. Though septic tanks is an accepted onsite treatment, as the septic tanks are not designed and maintained properly, the effluent does not confirm to the standards. The effluent from the septic tanks is directly let into the open drains, owing to which, the environment is degraded to a great extent. The wastewater from kitchens & bathrooms is discharged into storm water drains culminating finally to the Nallah. Since there is no soak pit arrangement, effluent from septic tanks is directly let into open drains. Due to poor maintenance, septic tanks do not function properly and often overflow into drains, which will ultimately joins local water bodies, creating unsanitary conditions and water/land pollution.

B. Infrastructure Improvements Proposed in Tonk under RUSDP

15. **Water Supply**. It is projected that the water demand of the town will increase from 27.58 MLD in 2016 to 34.70 MLD in 2031, and ultimately to 43.85 MLD by 2046.The water allocated from the ongoing Bisalpur water supply scheme is 60 MLD, which is sufficient to meet the demand up to year 2041. However, the water transmission and distribution network is old, profusely leaking and is badly in need of rehabilitation and replacement. Therefore, distribution system improvement and augmentation with NRW management is identified as the focus area for investment in Tonk under RUSDP.

16. Under the Tonk water supply component of the Subproject, it is proposed to provide a strategic water supply network connecting CWRs with ELSRs, in the form of a ring main that will supply water to all ELSRs. It is proposed to replace entire existing distribution network with new PE pipes with electro-fusion welded joints and electro-fusion saddles. The new distribution system will be conveniently divided into District Metering Areas consisting about 500 to 700 connections with flow from one direction to facilitate monitoring of NRW. Project will also provide bulk water meters, house service connections with consumer water meters.

17. **Sewerage**. A comprehensive sewerage system – sewage collection and conveyance network and a facility to treat the sewage to disposal standards, is proposed for Tonk town under this RUSDP. Sewerage system will cover entire town, barring areas with low population density (100 persons/hectare). Of the total base year population (2016) of 177,676, the subproject will cover 80% of the population and the rest 20% population, residing in the outer areas with low population density, will continue to depend on individual septic tank and soak pit arrangements. The sewer system will be designed as a separate sewer system that carries only the domestic wastewater, the open drain system that exists in the town will cater to storm runoff. New sewage treatment facility (with SBR technology) will be constructed in the already identified government land to meet the future demand of 19 MLD in 2011 and 32 MLD by 2046. It is proposed to develop 13 MLD STP in this project based on the past experience that only 50-60% of households (in the areas covered with sewerage) will be connected to sewer network. As and when the connections increase, STP capacity will be enhanced.

18. This subproject complies with the environmental subproject selection criteria agreed between the government and the ADB (Compliance checklist is at Appendix 7).Following **Table 2** shows the nature and size of the various components of the subproject. Conceptual layout plans are shown in Figure 1 to Figure 5.

Table 2: Proposed Water Supply & Sewerage Subproject & Components

Infrastructure	Function	Description	Location
1. Water Supply			
Distribution network Improvement	To distribute water from service reservoirs to consumers	*Replacement*- 248 km 63-600 mm dia DI/PE pipes *New* 141 km 63-300 mm dia DI/PE pipes	Pipes will be laid underground along the roads; this work will cover entire town as all the existing pipes is proposed to be replaced, and in currently uncovered areas new pipes will be laid About 80% of exiting pipes are of AC; and therefore

			existing pipes will be left as it is in the ground untouched.
Bulk Water Meters	Monitor water flow in the improved network	*New* 13 nos Bulk Meters	Fixed at strategic locations at source, CWR and network
Domestic Meters	Monitor & regulate water usage by consumers and improve cost recovery	*New* 26,188 Domestic Meters,	Meters will be attached to the water delivery pipe at each house with meter chamber
2. Sewerage			
Sewer network	Collect wastewater from dwelling units and convey by gravity to the STP	*New* 254 km; 200 to 900 mm diameter DWC pipes for sewers and uPVC for house connections	Sewers will be laid underground along the roads in the town. The work will extend to most of the town area, except the core town area where sewers are being laid
Sewage Treatment Plant	Treatment of collected wastewater to comply with disposal standards	*New* Sewage treatment plant of capacity 13.00 MLD Proposed process: SBR (sequential batch reactor). Components: • Mechanical screens • Grit removal, • Flow measurement & flow splitter box • Batch reactors with individual inlet flow control & a fully automated process • Mechanical sludge dewatering system • Short term (14 days) sludge holding area STP will be designed to comply with the standards for disposal into inland water bodies: BOD – 30 mg/l or less SS – 100 mg/l or less Faecal coliform -1000/100 ml or less	New STP will be constructed in the already identified government land on east side of the town. This site is located in the away from residential areas. Treated water will be reused for agricultural purposes.

19. Excavation for the pipe/sewer laying works will be undertaken through open trenching, which will be maximum width of 1 m only on one side of the road ROW with maximum length, an average 130 m per day for water supply lines and 60 m for sewers. Excavation, laying of pipes and backfilling will be completed within the day. Subsequent to completion of works, road reinstatement will be undertaken by the contractor as part of the civil works. The same shall be mentioned in the bid document to make it binding on the contractor.

20. The subproject is primarily designed to improve environmental quality and living conditions of Tonk through provision of water supply and sewerage. The benefits arising from this subproject include: (i) increased availability of potable water at appropriate

pressure to all households including urban poor; (ii) reduced time and costs in accessing alternative sources of water. (iii) better public health particularly reduction in waterborne and infectious diseases; (iv) reduced risk of groundwater contamination; (v) reduced risk of contamination of treated water supplies; and, (vi) improvement in quality of water bodies due to disposal of treated effluent meeting disposal standards.

C. Energy Efficiency Measures included in the subproject

21. Both the water supply and sewer network in Tonk are designed with utmost consideration to energy efficiency. Gravity flow systems adopted. Appropriate STP location is finalized to suit the gravity flow. In existing water supply system, water losses (UFW) are very high, reducing the losses and improving the efficiency of the system is identified as the most important component under RUSDP. This is considered as an alternative for source development/augmentation. It is proposed to use high efficiency pumps and motors within the STP to reduce the energy loads.

22. To make the project energy efficient, as part of this PPTA, “Guidelines for Adopting Eco-Friendly and Energy Efficient Equipment and Facilities in the Design of the Sub-Projects” have been prepared and is being followed in the design of the projects. According to Manual for the Development of Municipal Energy Efficiency Projects, 2008, energy savings, at minimum, of 25% to 40% is possible with appropriate measures. The following measures are being considered and incorporated into the subproject designs:

- Installation of Energy Efficient Motors
- Efficient Pumping system operation
- Installation of Variable Frequency Drives (VFDs)

D. Investment Program Implementation Schedule

23. The detailed design of this subproject will be completed by May 2014. After the approval, bid will be prepared and tenders invited by September 2014, and the contract will be awarded by January 2015. Construction is likely to start in February 2015, and will take about 36 months, i.e. the construction work is likely to be completed by February 2018.

Figure 1: Proposed Distribution Network Improvement

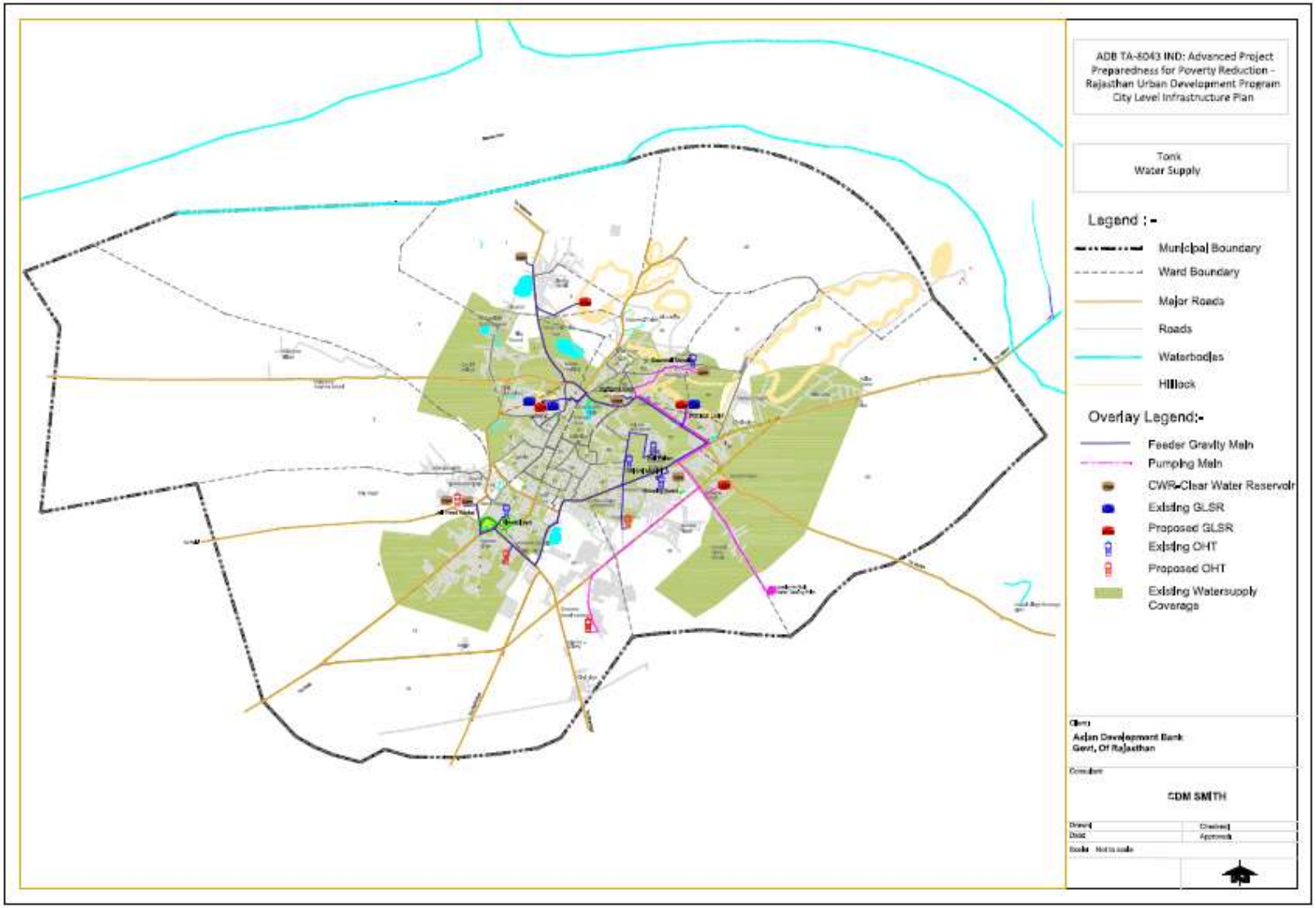


Figure 2: Proposed Sewer Network Coverage

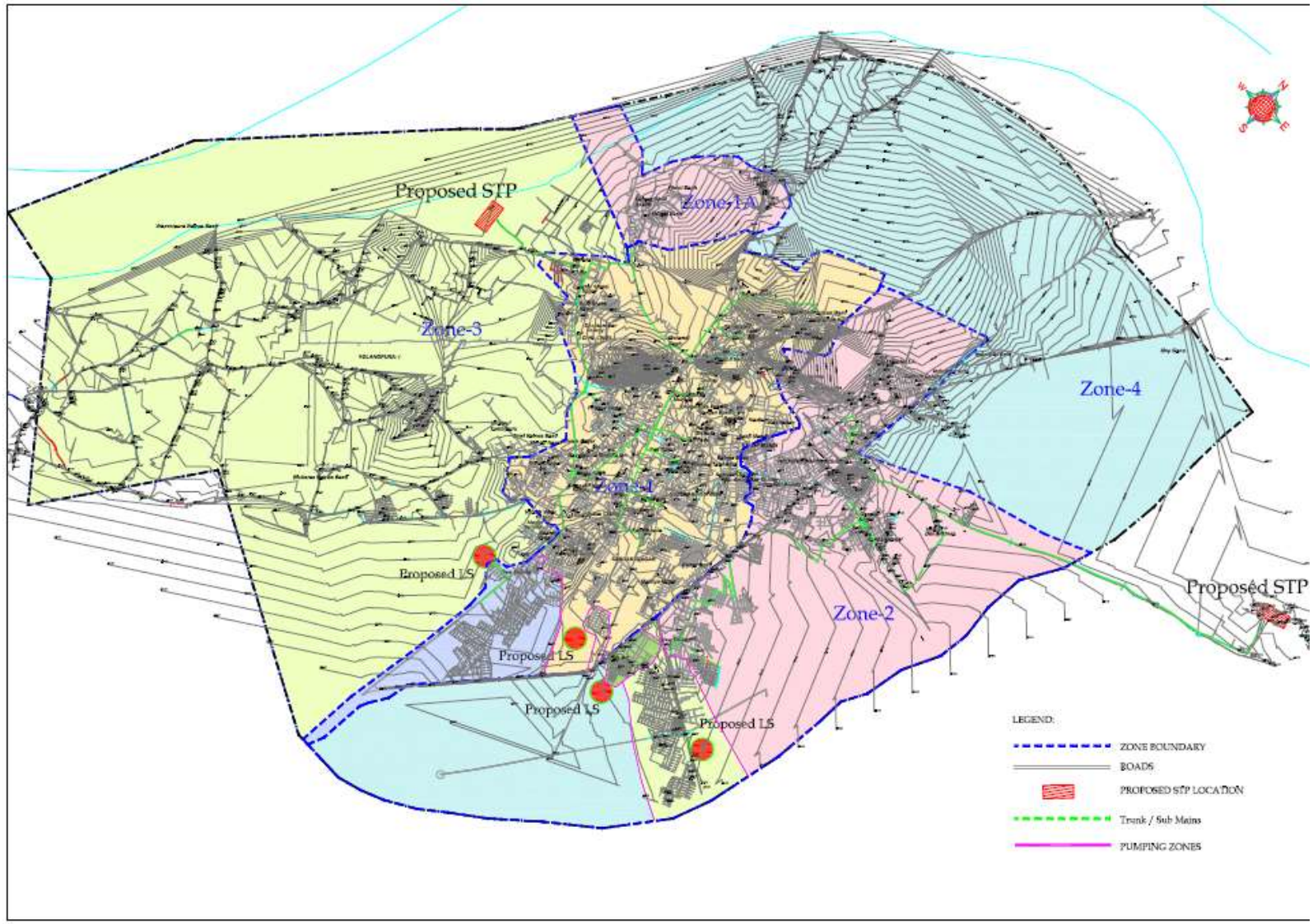


Figure 3: Proposed Sewer Network

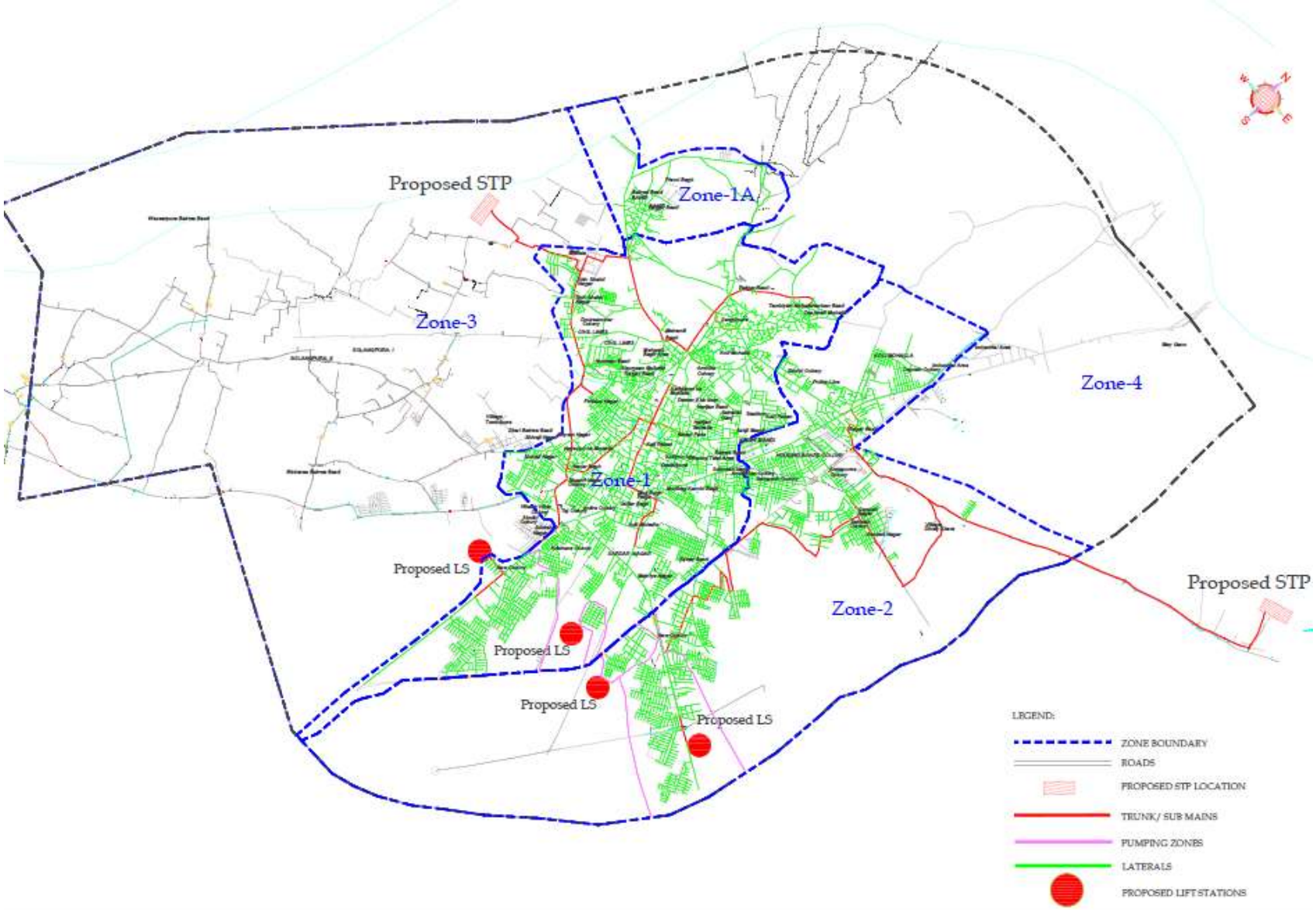


Figure 4: Location of Proposed STP Site & Poli Environs

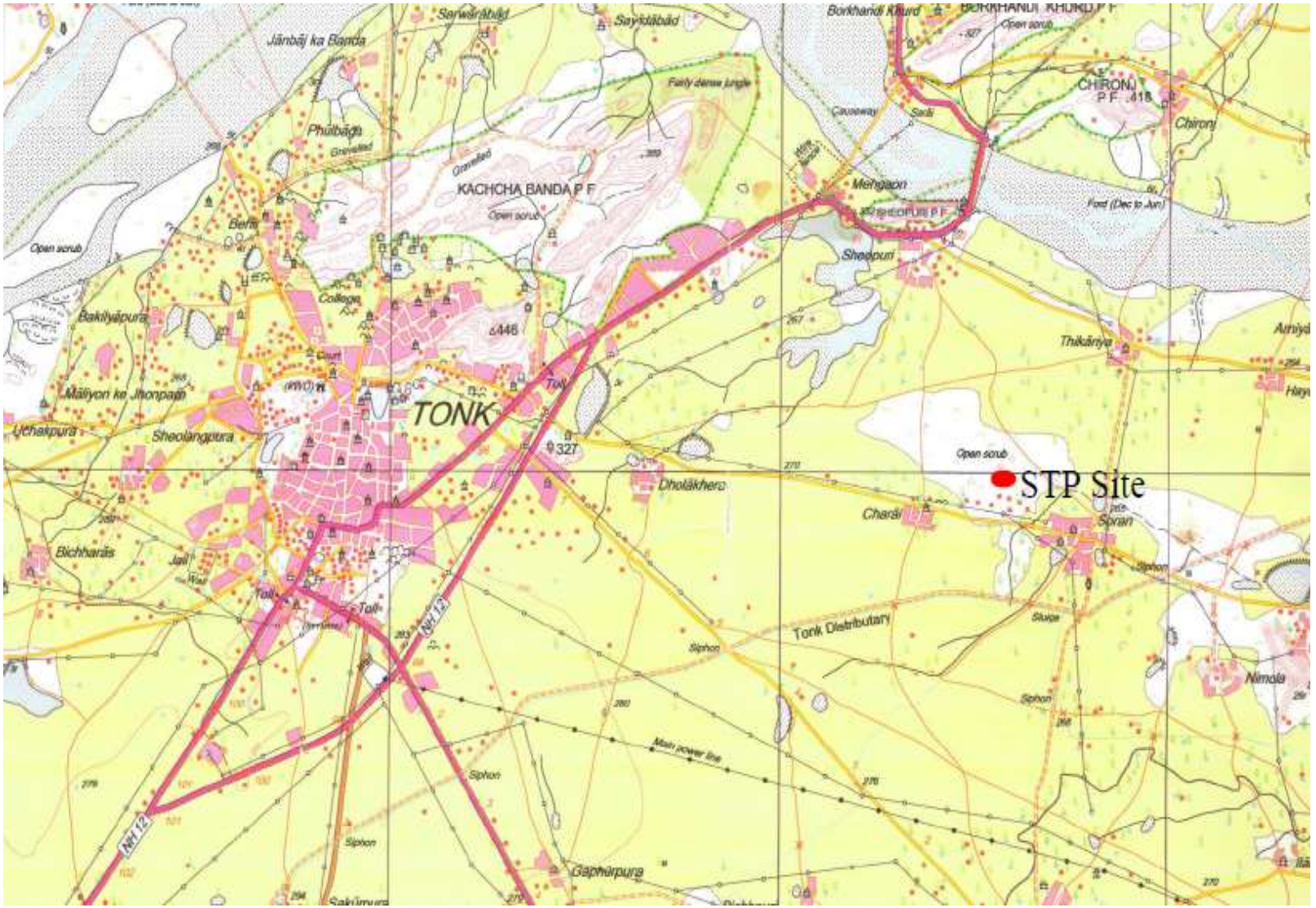


Figure 5: Proposed Treatment Process Flow Diagram

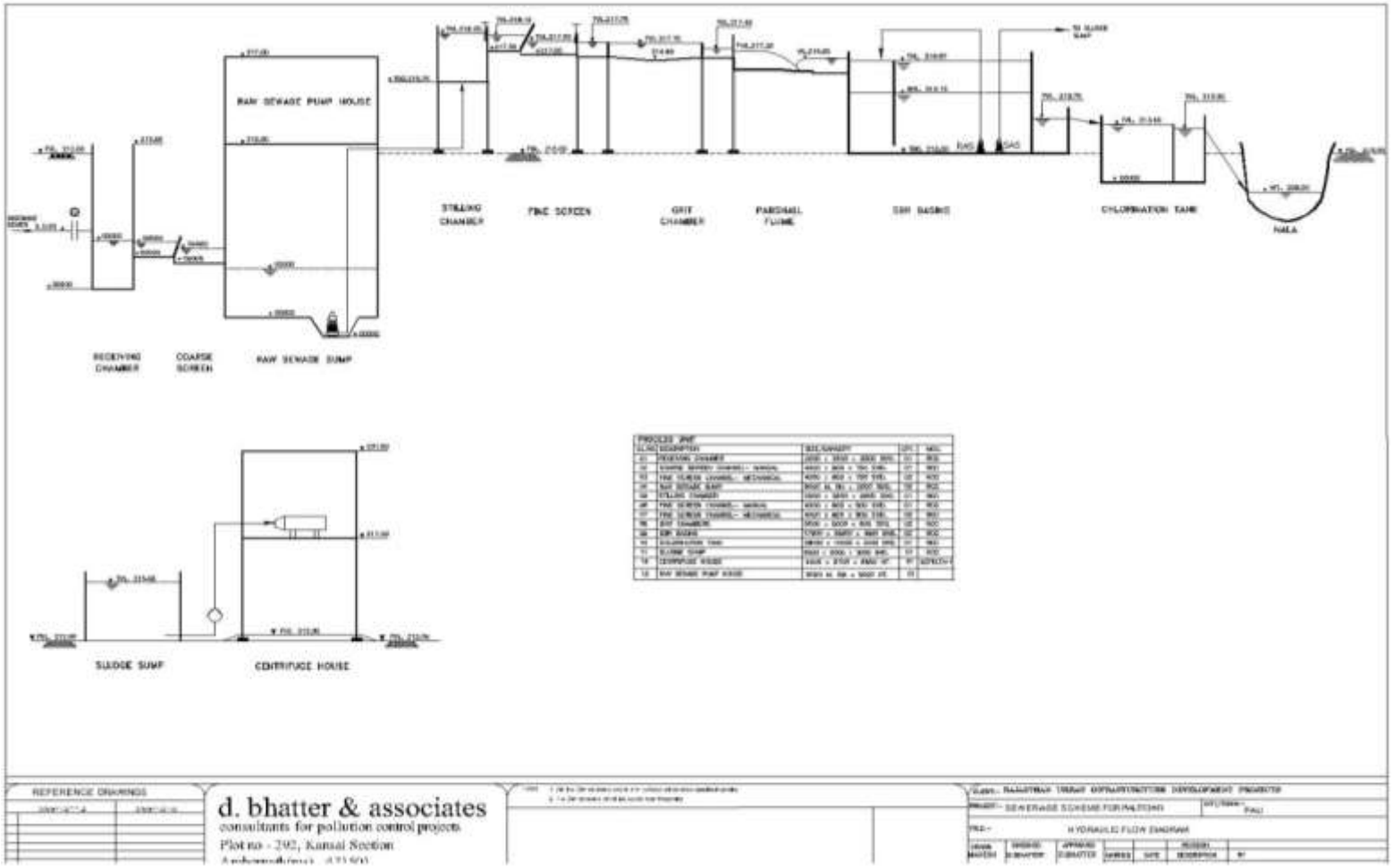
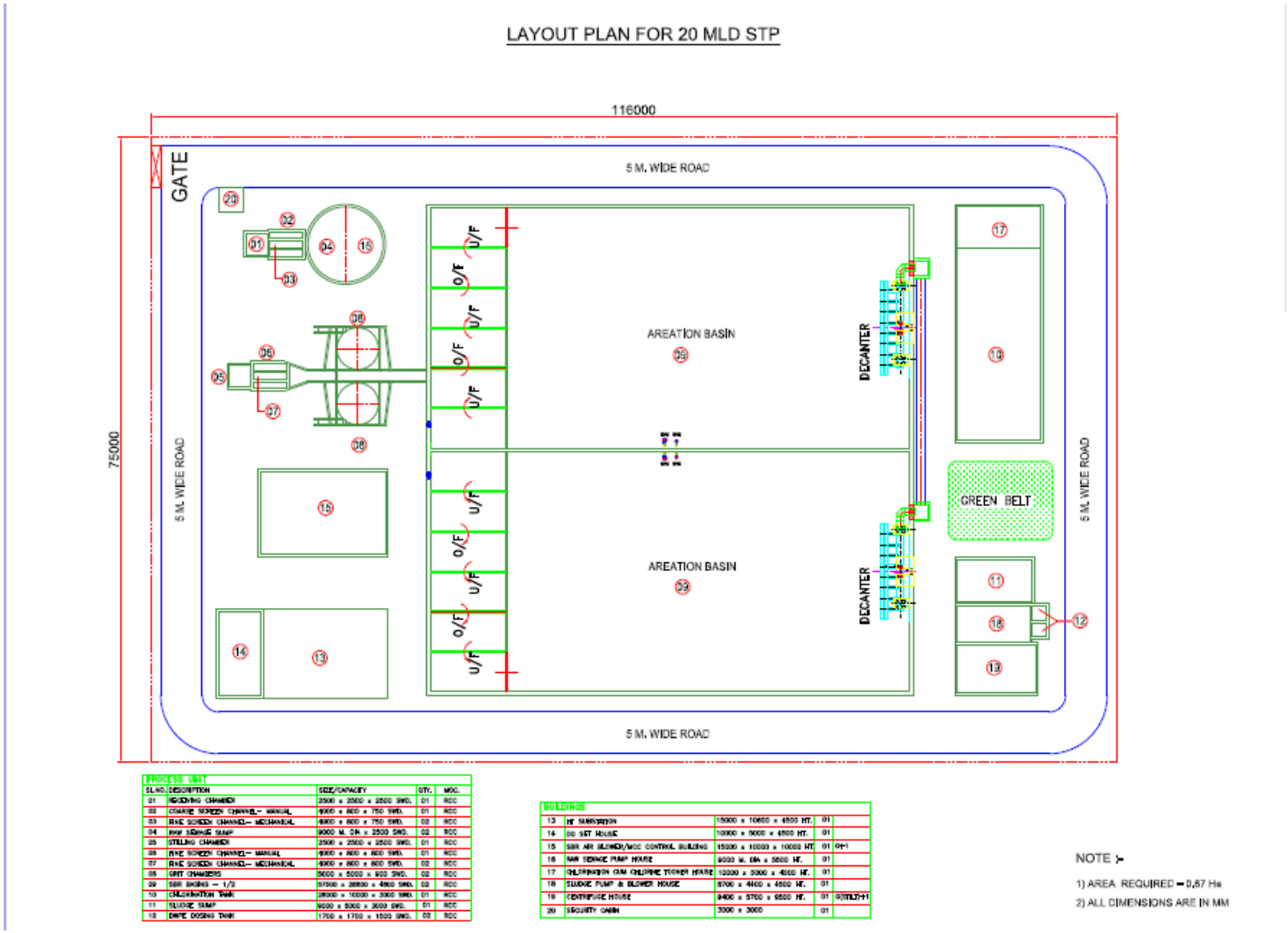


Figure 6: Layout Map of Proposed STP



III. DESCRIPTION OF THE ENVIRONMENT

A. Physical Resources

1. Location, Area & Connectivity

24. Tonk is the headquarter of Tonk District, and is situated in the south eastern part of Rajasthan State. It is located at about 95 km south of State Capital, Jaipur. Tonk was a princely state and was ruled predominantly by Muslim Rulers, and is referred as *Nawabon ka Shahar* or City of Nawabs. Geographically, it is situated at 26°17' north latitude and 75°47' east longitude at an average elevation of 274 m above mean sea level. Extending to an area of 70.12 sq.km under the jurisdiction of Tonk Nagar Parishad (Municipal Council) the population of the town is 165,294 (2011 Census). The town is divided into 45 municipal wards.

25. Tonk is well connected by road network with major cities, neighboring towns and its hinterland. Two highways - National Highway 12 (NH 12, connecting the state capital Jaipur with Jabalpur in neighboring Madhya Pradesh state) and NH 116 (connecting Tonk with Sawai Madhpur city in Rajasthan) pass through the town. These two NHs in turn connect with other national highways, providing good road connectivity to Tonk. Besides, other roads connect the town with neighboring towns and hinterland. Tonk is not connected by rail network; nearest railway station is at Banasthali-Newai, about 35 km from the town. Nearest airport is at Jaipur.

2. Topography, Soils and Geology

26. Tonk is developed near the right bank of River Banas. Topography is predominantly plain with a general elevation of 274 m above MSL. There are rugged rocky low range isolated hills in the northern part, between the town and the river, with highest elevation of 389 m above MSL. There are isolated hills within the town, some of which are inhabited. On the bank of Banas, there are sand dunes up to 20-30 m above the ground level.

27. Tonk District geology is characterized by different sedimentary metamorphic and igneous rocks. Tonk Town and surrounding region is mainly composed of rock types belonging to Bhilwara Super Group. The soil in the district varies from sandy loam to loam and from clay loam to loam. In Tonk block it is predominantly from sandy loam to loam. In Tonk urban area, soils are normally deep up to 7-10 m below ground level (bgl) except in the northern part of the town surrounding the hills, soils are very shallow (~1.5m). Soil cover is followed by weathered/ordinary rock from 1.5 – 4 m bgl, and then hard rock from 4 m.

3. Seismology

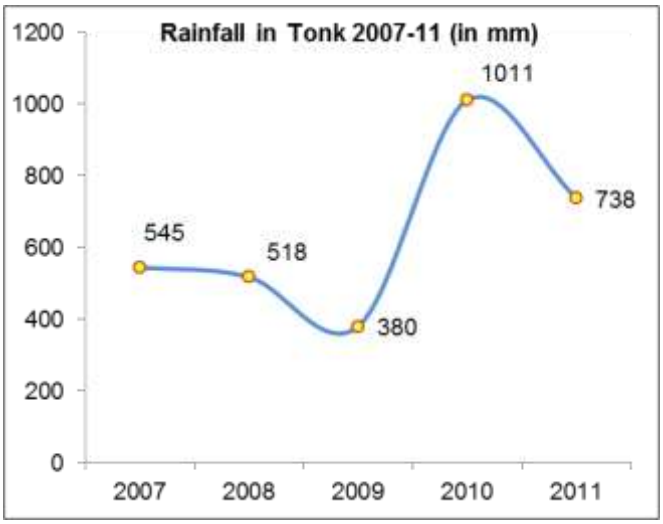
28. As per the seismic zoning map of India, Tonk Town falls under the Zone II, which is the lowest earthquake risk zone in India. This zone is termed as “low damage risk zone”.

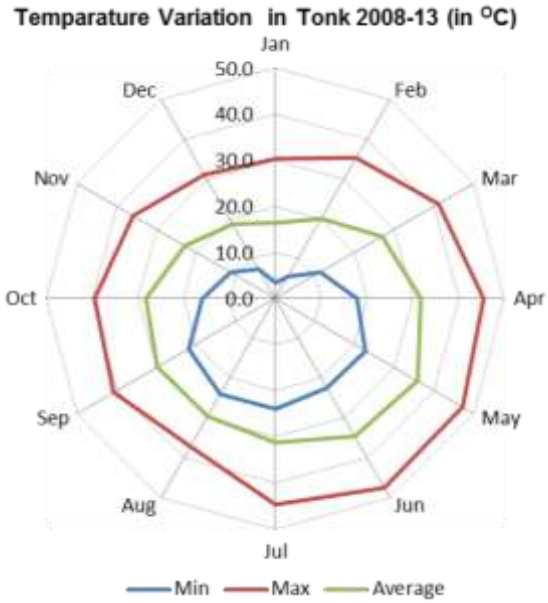
4. Climatic Conditions

29. Tonk is located in the semi-arid climate zone with predominantly dry weather through most part of the year. Summers are long (March to June/July) and hot, with temperatures peaking, in May/June. With the start of monsoon season in late June/July, temperatures tend to cool down slightly. Monsoon season continues till September, followed by post monsoon till November. Winter season is from November to February. Temperatures are lowest in January. During the period of 2008-13, minimum temperature was recorded as 3.5oC in

January and maximum of 47.4 ^{o}C in June.

30. Tonk receives rainfall predominately from southwest monsoon. Over 90 percent of annual rainfall is during this period of June to September Annual average rainfall (1979-2008) is 622 mm. It is noted by CGWB that rainfall has increased significantly in the recent past in Tonk District, compared to the long term average of 598 mm of 1901-70. Highest rainfall in the recent history is recorded as 1,011 mm in the year 2010.





31. Humidity varies with the temperature and rainfall. In summers, the humidity is around 40 to 50%, rainy season it is 70 to 80% and in winter it is 60 to 70%. Average wind speed is varies across the year between 3.3 and 6.5 kmph, with strong winds in summer.

5. Surface Water

32. Tonk is situated on the right bank of River Banas, which is one of the important rivers of Rajasthan. River Banas originates in the Khamnor hills of the Aravali range and flows along its entire length through Rajasthan. Banas is a major tributary of the River Chambal, and joins it in Sawai Madhopur District. The total length of the river is 512 km, of which 135 km is in Tonk District. River Chambal in turn flows into River Yamuna, tributary of River Ganga (the Ganges). River Mashi originating in the hills near Kishangarh in Ajmer District, is a tributary of Banas River, and joins it near Tonk. Bisalpur Dam, constructed across Banas River in Tonk district, about 70 km upstream of Tonk Town is the most important source of water supply in Rajasthan for both irrigation and drinking water. River is non-perennial with large seasonal fluctuations in flow. In poor rainy years river goes completely dry for couple of months in summer. Besides Banas, there are several small ponds/lakes in Town, which are mostly dry throughout the year, due to low rainfall and also due to encroachments and blockage of inlet channel. Sheopuri Lake, on the eastern outskirts of the town, is the only water body which holds water throughout the year, however due to entry of wastewater, and disposal of solid waste, water is polluted.

33. Banar River is famous for its sand. Besides construction, sand is widely used as filter media in treatment plants. Illegal sand mining is rampant in Tonk, and this uncontrolled mining has several negative impacts on environment and local infrastructure. The open wells constructed in the bank of river and water supply pipelines are frequently damaged due to mining activity.

34. Water quality of River Banas at Bisalpur Dam is shown in the following Table. Water

is supplied to Tonk from this source. As per the CPCB's surface water quality criteria, raw water quality meets the 'C' class criteria which denote the best use as "drinking water source after conventional treatment and disinfection".

Table 3: Banas River Water Quality at Bisalpur Dam, Tonk (2011)

Parameter		Banas Water Quality	Water Quality Criteria
DO mg/l	Min	3.2	4 or more
	Max	8.2	
	Mean	5.9	
pH	Min	7.5	6.5 – 8.5
	Max	8.6	
	Mean	8.3	
Conductivity µmho/cm	Min	160	Not specified
	Max	410	
	Mean	290	
BOD mg/l	Min	0.4	3
	Max	4.2	
	Mean	1.9	
Nitrate mg/l	Min	0.02	Not specified
	Max	0.54	
	Mean	0.19	
Feacal coliform MPN/100 ml	Min	3	Not specified
	Max	7	
	Mean	4	
Total coliform MPN/100 ml	Min	4	500
	Max	75	
	Mean	19	

6. Groundwater

35. In Tonk District, ground water occurs mostly under phreatic conditions. In alluvial areas, ground water generally occurs under water table conditions where as in hard rock and crystalline rocks, it is under slight pressure. The weathered zone below the water table acts good storage for ground water. The movement of ground water is controlled by the weathered zone, joints, fissures, fractures, bedding planes and other structurally weak zones in hard rock and grain size distribution in alluvium. The movement is further controlled by the extent, size, openness, continuity and interconnection of fractures. Quaternary Alluvium, Phyllites Schist, and Granitic- gneisses are the major hydrogeological formation in the district.

36. Ground water in alluvial areas, near Banas River, occurs in the sand, gravel, pebble and boulder beds, under unconfined conditions. The average water table in Tonk block is 11.98 m. The average fluctuation in ground water table ranges from 10.25 to 14.83 m in post monsoon to 13.70 to 15.50 m in pre-monsoon. The overall water table is depleting and it has gone down by 9.17 m during the period 1984 - 2008.

37. Groundwater quality of a well located in Tonk is presented in the following **Table 4**. Water shows high values of electrical conductivity and fluoride.

Table 4: Groundwater Quality in Tonk (2009)

Parameter		Tonk	Drinking water standard (IS 10500)	
			Desirable limit	Permissible limit@
pH	Min	7.8	6.5 – 8.5	-
	Max	8.65		
	Mean	8.23		

Conductivity µmho/cm	Min	500	750	2000
	Max	4380		
	Mean	2440		
Nitrate mg/l	Min	4.72	45	100
	Max	156		
	Mean	80.36		
Fluoride mg/l	Min	0.28	1	1.5
	Max	7.3		
	Mean	3.79		

Source: Central Pollution Control Board
@ 'permissible limit in the absence of alternate source'

7. Air Quality

38. There is no ambient air quality monitoring station in Tonk, and therefore no data on ambient air quality is available. Industrial development in Tonk is limited, and air pollution is mainly due to dry weather, dusty roads and traffic. Due to these, particulate matter is likely to be high, particularly during summer dust storms driven by relatively strong north-west to south-west winds.

B. Ecological Resources

39. There are no notable ecological resources in the area. The hilly area in the northern part between the town and Banas River is notified as forest area. This is called as Kachacha Banda Protected Forest, and is devoid of any notable vegetation or tree cover. This is mainly open scrub forest with denuded hills. The rest of the town is mostly urban, and due to dry weather tree cover in the town is also very limited.

C. Economic Development

1. Land use

40. The total area under the jurisdiction of Tonk Nagar Parishad is 70.12 sq. km. As per the existing land use data (2011), available for 13.92 sq. km of the town, 68% of total area is classified as developed area, and the rest is undeveloped area. Within the developed area, predominant land use is residential (47%), followed by public and semi-public land uses (including recreational, utilities) covering 40% of the area. About 97% of the undeveloped area is vacant lands/open spaces, and the rest 3% is covered with water bodies.

41. Tonk is located close to Jaipur (90 km) and along a main transport corridor in the state connecting Jaipur with Kota City in the south. The city is expanding on west, south & east directions. There are natural barriers towards northern side in the form of River Banas and hilly areas, where there is no urban expansion is expected.

2. Industry & Agriculture

42. Tonk District is endowed with a number of non-metallic mines. Garnet, silica, quartz and soap are found in abundance. Besides, felspar, mica and corundum are also found but in small quantities. Tonk District is also famous for construction materials like sand, bricks, clay, masonry stone, etc. Banas river sand of Tonk is known for its quality, and is exported to distances places for various specific purposes like water filtration. Industrial development in Tonk is very limited and most are small scale and cottage units. Most of the industries are agro-based units and engaged in building materials. There are also few engineering and chemical industries. Tonk is famous for leather goods, carpet, beedi making, etc. Rajasthan

State Industrial Development and Investment Corporation Limited (RIICO) has developed 24 ha of land for industrial use. This industrial area houses medium and small scale industrial units; of the total 69 units, at present only 38 units are functional.

43. Due to predominant dry weather and low rainfall, agricultural activity is limited. Animal husbandry and dairy activities are predominant. As per the census 2011, about 9% of total workers are engaged in primary agricultural related activities. The main agricultural seasons are Kharif (April-September: millet, groundnut, cotton, etc.) and Rabi (October-March: wheat, barley, mustard, etc.).

3. Infrastructure

44. **Water Supply.** PHED provides piped water supply in the town. At present 80% of the town area is covered with water supply network, and provides water supply to almost entire population either through individual water service connections, or through public stand posts, mobile tankers. At present, Tonk depends on groundwater – from the open shallow wells (24 no,s) drilled on the Banas River bank, and tube wells (42 no,s) in several parts of the town. Considering the grave situation, it is proposed to supply 8 MLD of water to Tonk from Bisalpur Dam. Necessary civil works are being done to receive and store this water further distribution. There are no treatment facilities, except that groundwater is disinfected and supplied to consumers. Water quality is poor with high electrical conductivity. Water from bore wells is pumped to elevated service reservoirs for supply by gravity. Total storage capacity is 5.34 million liters. Existing distribution network is mostly of Asbestos Cement (AC) pipes (total length 252.80 km) and there are 16,700 house service connections. Current gross rate of water supply is 78 LPCD, however due to heavy losses in the system (41%), supply at consumer end is only 48 LPCD, which is far below the standard of 135 LPCD. The water transmission and distribution network is old, profusely leaking and is badly in need of rehabilitation and replacement. Water supply is intermittent – supplied alternative day for about 1.5 hours.

45. **Sewerage**. There is no sewerage system existed in Tonk. Most of the households in the town have individual toilets although open defecation is also prevalent. Due to lack of sewerage system depend on septic tanks for disposal of sewage, since there is no soak pit arrangement, effluent from septic tanks is directly let into open drains. Wastewater from kitchen, bathrooms (sullage), and sewage from houses without septic tanks directly discharged into open drain, that ultimately joins Banas River.

46. **Solid Waste Management**. About 57 tons of solid waste is generated in the town daily. Tonk Nagar Parsihad is responsible for collection, transportation and safe disposal of municipal solid waste generated in the town. There is no door-to-door waste collection system in the town. Waste bins are also placed at various locations in the town for depositing the waste. Indiscriminate disposal of waste in open areas/vacant plots, drains in the city is common. There is no landfill facility in the town; the collected unsegregated waste is disposed by crude open dumping method at several places in the outskirts of the town. TNP has identified land for development of waste processing and sanitary landfill facility. Waste generated from markets is collected and transported to disposal area by a private contractor engaged by the TNP.

47. **Storm Water Drainage**. Open drainage system is provided in town for collection and conveyance of rain water from the town. About 40% of the town roads are provided with open drains, which ultimately discharge water into River Bandi. Due to lack of sewerage system, the drains are presently carrying wastewater including sewage. Since rains are confined only to a short duration in monsoon, the drains mostly carry wastewater. Indiscriminate disposal of solid waste into drains is common, due to which drains are often chocked. Though most of the drains are of concrete.

48. **Power Supply**. Thermal power is the main source of energy in Rajasthan, contributing nearly 90% of the electricity, compared to hydropower, which produces the remainder. State-level companies (Rajya Vidyut Utpadan Nigam Ltd, RVUN; and Rajya Vidyut Prasaran Nigam Ltd, RVPN) are responsible for power generation and transmission respectively, and distribution is provided by a regional company, the Jaipur Vidyut Vitaran Nigyam Limited (JVVNL). Power is supplied from the central grid by overhead cables carried on metal and concrete poles, mainly located in public areas alongside roads. The power supply in the state is continuous and reliable, except in warmer months with periodic outages in warmer months, and large fluctuations in voltage.

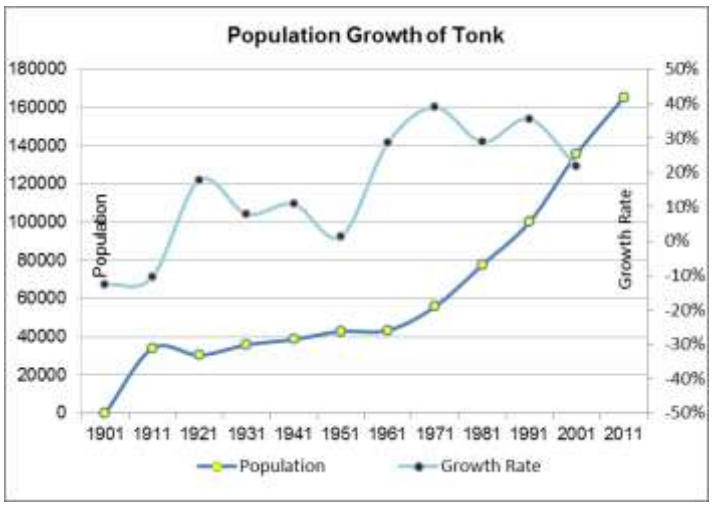
49. **Transport**. The old city area is characterized by very narrow roads that are frequently congested with traffic and pedestrians. In contrast the remainder of the town has a relatively good road system, particularly in the outer areas, where streets are wide and not heavily used by traffic. The total road length in the town is 362 km, of which 14% are surfaced with bitumen/tar, 47% are with cement concrete and 39% are unpaved. Most of the roads are maintained by NTP and around 25% by the Public Works Department (PWD). Road the condition is generally poor, with many roads in need of repairs and resurfacing. This plus the absence of parking spaces and pedestrian walkways leads to slow traffic and congestion. Transport in the city is mainly by personal vehicles (cars and motorcycles) and motor- and bicycle-rickshaws. The Rajasthan State Road Transport Corporation (RSRTC) runs public buses to neighbouring villages and towns and to larger towns, such as Jaipur, with which there are good road connections.

D. Socio Cultural Resources

1. Demography

50. Tonk population, as per 2011 census, is 165,294, grown from 135,689 in 2001, registering a compounded annual growth rate of 2% (decadal growth of 21.8%), which is lower than the state urban population growth rate of 2.58% for the same decade. As presented in the Chart below, the rate of growth has shown no proper trend. Gross population density of the town is 236 persons/ha. Population density varies widely across the town – the central, old areas of the town have high density, and the outer areas are sparsely developed. Highest population density is in ward no. 39 (1114 person/ha) and the lowest is in wards 1, 2, 3, 4, 19, 33 and 45 (less than 10 persons/ha). Average household size of Tonk is 5.68.

51. Sex ratio of the town is 947 females per 1000 males. This is lower than Tonk district's sex ratio (949) but significantly higher than the state-level figure of 928. Literacy rate is 58.72% (Census 2011), which is lower than the state literacy rate of 66.11%. In Tonk, male and female literacy rate is recorded as 67.8% and 42.2% respectively. Scheduled Caste (SC) and Scheduled Tribe (ST) population comprises 16 percent and 1 percent of the total population respectively. Workforce participation rate in Tonk is 30.3 percent, which is higher the State level WPR of 29.6%.



52. Largest proportion of population comprises Hindus followed by Muslims, Jains, Sikhs and Christians. Main languages spoken are Rajasthani and Hindi.

2. History, Culture and Tourism

53. As per the legends Tonk has historical significance, and is known to be connected with Bairath culture and civilization. It is believed that town is named as 'Tonk' from 'Tonkra' in 1643 AD by one Bhola Nath Brahman. Tonk is known as 'Nawabon ka shehar' (city of nawabs). Tonk was a princely state and was part of erstwhile kingdoms of Maharaja Sawai Jai Singh, Madho Singh, Prithivi Singh, Jaswant Rao Holkar, Kashi Rao Holkar, Pir Ji Sahib, Khande Rao. Tonk came into the possession of Nawab Amir Khan in 1806, after he conquered it from Balwant Rao Holkar. It was recognized a powerful state by the East India Company and in 1817 a settlement treaty was signed between Nawab Amir Khan and East India Company. Tonk thereafter was ruled over by seven Nawabs. Ultimately after the independence of India, it was merged with Rajasthan State in 1948.

54. **Tourism**. There is no much tourism potential in Tonk district. Following are located within the town, and attract tourists/pilgrims from the region.

(i) **Sunehri Kothi (Mansion of Gold)**. Built by Mohammad Ibrahim Ali Khan, Nawab of Tonk, during late 1800's and early 1900's, for music, dance and poetry recitals it is the most visited tourist attraction in the town. The building also showcases glass paintings. Walls of the building are polished in gold, and the halls present a pretty picture with enameled mirrors. This is recognized as protected monument by Government of Rajasthan.

(ii) **Jama Masjid.** The Jama Masjid of Tonk is one of the biggest mosques in India and several devotees travel to the town to visit this Islamic shrine. This was constructed in 1246-1298 by then Nawabs Amir Khan and his son Nawab Wazirudhoula.

E. Environmental Settings of Investment Program Component Sites

55. The subprojects include laying of water supply pipes and sewer network in the municipal area of Tonk, and construction of a Sewage Treatment Plant. Pipes and sewers will be laid along the roads/streets in the town within the road right of way (ROW). In wider roads pipes/sewers will be laid in the road shoulder beside the tarmac, and in narrow roads, where there is no space, pipes/sewers will be laid in the road carriage way by break opening the tarmac. Roads in the old part of the town are quite narrow (~3m), and in the rest of the town roads are wider. Roads are lines both sides with open drains. There are no trees along the roads, except in some new colonies in the outer areas. In old town pipes/sewers will be laid in the middle of the road, which may affect the traffic. Bigger diameter strategic water mains and trunk sewers will be laid along the main roads, which are wide and have adequate space. No tree cutting is anticipated as there is adequate space to lay the sewer/pipelines in those roads.

56. Proposed STP will be constructed on a vacant government land, about 5 km east of the town. Site is located near village Soran. Site is located ideally away from any habitations, and is mostly surrounded by agricultural fields. Site is currently vacant, and devoid any notable vegetation, and is sparsely covered with shrubs and bushes It is proposed to use the

treated water for irrigation in the nearby fields.

IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

57. Potential environmental impacts of the proposed infrastructure components are presented in this section. Mitigation measures to minimize/mitigate negative impacts, if any, are recommended along with the agency responsible for implementation. Monitoring actions to be conducted during the implementation phase is also recommended to reduce the impact.

58. Screening of potential environmental impacts are categorized into four categories considering subproject phases: location impacts and design impacts (pre-construction phase), construction phase impacts and operations and maintenance phase impacts.

a. **Location impacts** include impacts associated with site selection and include loss of on-site biophysical array and encroachment either directly or indirectly on adjacent environments. It also includes impacts on people who will lose their livelihood or any other structures by the development of that site.
b. **Design impacts** include impacts arising from Investment Program design, including technology used, scale of operation/throughput, waste production, discharge specifications, pollution sources and ancillary services.
c. **Construction impacts** include impacts caused by site clearing, earthworks, machinery, vehicles and workers. Construction site impacts include erosion, dust, noise, traffic congestion and waste production.
d. **O&M impacts** include impacts arising from the operation and maintenance activities of the infrastructure facility. These include routine management of operational waste streams, and occupational health and safety issues.

59. Screening of environmental impacts has been based on the impact magnitude (negligible/moderate/severe – in the order of increasing degree) and impact duration (temporary/permanent).

60. This section of the IEE reviews possible project-related impacts, in order to identify issues requiring further attention and screen out issues of no relevance. ADB SPS (2009) require that impacts and risks will be analyzed during pre-construction, construction, and operational stages in the context of the project's area of influence.

61. The ADB Rapid Environmental Assessment Checklist in http://www.adb.org/documents/guidelines/environmental_assessment/eaguidelines002.asp has been used to screen the project for environmental impacts and to determine the scope of the IEE.

62. In the case of this project (i) most of the individual elements are relatively small and involve straight forward construction and operation, so impacts will be mainly localized and not greatly significant; (ii) most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving excavation and earth movements; and (iii) being located in an urban area, will not cause direct impact on biodiversity values. The project will be in properties held by the local government and access to the project location is through public rights-of-way and existing roads hence, land acquisition and encroachment on private property will not occur.

B. Pre-Construction Impacts

63. **Design of the Proposed Components**. The Central Public Health and Environmental Engineering Organization (CPHEEO) manual suggests a design period of 15/30 years[3] in general while designing the systems for water supply and sewerage components. It is proposed to consider 2046 as the design year for all the components in order to maintain unanimity in the design period and design population. Accordingly, 2016 shall be the base year and 2031 the intermediate year to cross check the designs pertaining to intermediate demand. The rate of water supply has been taken as 135 lpcd for 100% population. Sewage generation is 85% of water supply (including 5% to account for infiltration) and coverage is 100% population. For sewerage design, though sewerage system will be made available for 100% population, it is assumed based on the experience from other towns that only 70% of design year population will be connected to sewer system, and STP capacity is designed to meet such demand.

64. **Design of Sewage Treatment Plant**. A 13 MLD STP is proposed to be constructed in Tonk. It is proposed that the treated wastewater will be used for irrigation purpose, and alternatively when there is no irrigation demand, treated wastewater will be disposed into a nearby stream. The STP process therefore should be designed to meet the following CPCB standards for wastewater disposal into inland water bodies, which are stringent than irrigation use standards (ref **Appendix 4** for detailed parameters) notified under the Water (Prevention and Control of Pollution) Act, 1974.

	Disposal into inland water bodies	**Irrigation use**
BOD	less than 30 mg/l	less than 100 mg/l
Suspended solids	less than 100 mg/l	less than 200 mg/l
Faecal coliform	less than 1000/100 ml	less than 1000/100 ml

65. Accordingly, it is proposed to adopt sequential batch reactor process for sewage treatment in Tonk. SBR treatment process consists of following components:

(i) Inlet works with mechanical screens, grit removal, flow measurement & flow splitter box
(ii) Four square batch reactors with individual inlet flow control & a fully automated process
(iii) Mechanical sludge dewatering
(iv) Short term (14 days) sludge holding area

66. The SBR based STP will require uninterrupted power supply for operation of all the activities from inlet to treatment, and for sludge dewatering. Disruption in power supply will lead to process upset, may affect the efficiency of treatment, and result in treated effluent quality not meeting the disposal standards. In the context of urban local bodies in India, SBR is a recent and an advanced technology. Technical know-how is very limited or even nil with the local bodies. Although the system will be designed for automated operation with minimum human interference, it is necessary that the Tonk Nagar Parishad has basic understanding of technical features (design, and operation and maintenance).

67. The above issues need to be considered in design and operation of STP. Appropriate measures, such as the following, shall be integrated into planning and design of the STP.

(i) Ensure continuous uninterrupted power supply

[3] As per CPHEEO, pumps, motors, STP, storage reservoirs are to be designed for a life of 15 years.

(ii) Provide back-up facility (such as generator) and make sure that adequate fuel supplies during operation for running of generator when required;
(iii) Provide operating manual with all standard operating procedures (SOPs) for operation and maintenance of the facility; this should include guidance on the follow up actions in case of process disruptions, inferior quality of treated water; etc. Necessary training (hands-on and class room / exposure visits) shall be provided to the ULB staff dealing with STP.
(iv) The scope of work of facility contractor should include extended operation period (at least five years) to ensure smooth operation, training to the ULB staff and transfer of facility to the Tonk Nagar Parishad

68. One of the critical aspects in STP operation is, change in raw sewage characteristics at inlet of STP may affect the process and output quality. The system is designed for municipal wastewater, which does not include industrial effluent. Characteristics of industrial effluent widely vary depending on the type of industry, and therefore disposal of effluent into sewers may greatly vary the inlet quality at STP, and will upset process and affect the efficiency. Although legally the disposal of effluent meeting certain standards is allowed into municipal sewers (refer **Appendix 4**), the monitoring of the same is not-practical. Industrial development in Tonk is very limited, there are however few industries (chemical and textile) in town with problematic water discharges. Therefore disposal of such wastewater into sewers will impede the treatment efficiency. Following measures should be incorporated:

(i) No industrial wastewater shall be allowed to dispose into municipal sewers
(ii) No domestic wastewater from industrial units shall be allowed into municipal sewers
(iii) Ensure that there is no illegal discharge through manholes or inspection chambers
(iv) Conduct public awareness programs; in coordination with RPCB, issue notice to all industries for compliance
(v) Conduct regular wastewater quality monitoring (at inlet and at outlet of STP) to ensure that the treated effluent quality complies with the standards

69. The SBR being an aerobic process and conducted in a compacted and a closed system with automated operation, odour nuisance will be minimal. However, bad odours may be generated from wet well, primary treatment units and sludge treatment. Besides operating the plant as per the standard operating procedures, the following measure should be included in the designs:

(i) Provide a green buffer zone of 5-10 m wide around the STP; this should be planted with trees in multi-rows. This will act as a visual screen around the facility and will improve the aesthetic appearance. Treated wastewater shall be used for tree plantation

70. **Sewage sludge** generally consists of organic matter, pathogens, metals and micro pollutants. The concentration of parameters such as metals can be influenced by input to the sewers system from industry. Since no industrial wastewater is allowed into sewers, it is unlikely that sludge contains heavy metals. The sludge from reactors will be collected in sludge sump and conveyed to centrifuge for dewatering. The sludge in the form of a wet cake will be further air-dried in the sludge drying beds. The treatment and drying processes kill enteric bacteria and pathogens, and because of its high content of nitrates, phosphates and other plant nutrients the sludge is an excellent organic fertilizer for application to the land. Adequate drying is however necessary to ensure maximum kill of enteric bacteria. To achieve adequate drying minimum drying period (15 days) shall be ensured. The drying period, which will be varying depending on the season, shall be determined during detailed design. A sludge management plan will be developed by the STP facility designer. Sludge

shall be periodically tested for presence of heavy metals. Proper sludge handling methods should be employed. Personal Protection Equipment should be provided to the workers.

71. Dried sludge can be used as soil conditioner. Periodic testing of dried sludge will be conducted to ensure that it does not contain heavy metals that make it unsuitable for food crops. Tests will be conduct to confirm the concentrations below the following standards. As there are no specific standards notified for sludge reuse, the compost quality standards notified under the Municipal Solid Waste Management & Handling Rules, 2000 have been adopted here. The MSWMH Rules stipulate that "In order to ensure safe application of compost, the following specifications for compost quality shall be met":

Table 6: Characteristic of sludge for use as soil conditioner

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

*Compost (final product) exceeding the above stated concentration limits shall not be used for food crops. However, it may be utilized for purposes other than growing food crops.
Source: Municipal Solid Waste (Management & Handling) Rules, 2000, Government of India

72. **Sewer system – collection & conveyance.** The sewerage system is designed as a separate system of sewage collection (i.e. caters only to wastewater). There is considerable length of existing surface drains in the project area that can be used for disposal of storm runoff. The underground gravity sewers will carry sewage from households to the STP. To maximize the benefits as intended, Tonk Nagar Parishad should ensure that all existing septic tanks are phased out by bypassing the inlet and connecting the toilet discharge from each house directly to sewerage system.

73. Accumulation of silt in sewers in areas of low over time, overflows, blockages, power outages, harmful working conditions for the workers cleaning sewers etc. are some of the issues that needs to be critically looked into during the sewer system design. A properly designed system is a must for system sustainability. Another critical aspect is change in raw sewage characteristics at inlet of STP may affect the process and output quality.

74. Measures such as the following shall be included in sewer system design to ensure that the system provides the benefits as intended:

(i) Limit the sewer depth where possible
(ii) Sewers shall be laid away from water supply lines and drains (at least 1 m, wherever possible);
(iii) In all cases, the sewer line should be laid deeper than the water pipeline (the difference between top of the sewer and bottom of water pipeline should be at least 300 mm)
(iv) In unavoidable, where sewers are to be laid close to storm water drains, appropriate pipe material shall be selected (stoneware pipes shall be avoided)
(v) For shallower sewers and especially in narrow roads , use small inspection chambers in lieu of manholes;

(vi) Design manhole covers to withstand anticipated loads & ensure that the covers can be readily replace if broken to minimize silt/garbage entry
(vii) Ensure sufficient hydraulic capacity to accommodate peak flows & adequate slope in gravity mains to prevent buildup of solids and hydrogen sulfide generation
(viii) Equip pumping stations with a backup power supply, such as a diesel generator, to ensure uninterrupted operation during power outages, and conduct regular maintenance to minimize service interruptions. Consider redundant pump capacity in critical areas

75. **Utilities**. Telephone lines, electric poles and wires, water lines within the proposed project locations may require to be shifted in few cases. To mitigate the adverse impacts due to relocation of the utilities, the contractor, in collaboration with ULB will (i) identify the locations and operators of these utilities to prevent unnecessary disruption of services during construction phase; and (ii) instruct construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.

76. **Social and Cultural Resources**. Any work involving ground disturbance can uncover and damage archaeological and historical remains. For this project, excavation will occur in project sites, so it could make medium risk of such impacts if the site contains any archeological and historical remains. Nevertheless, PIU will:

(i) consult Department of Archaeology and Museums to obtain an expert assessment of the archaeological potential of the site;
(ii) consider alternatives if the site is found to be of high risk;
(iii) include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available; and
(iv) develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognised and measures are taken to ensure they are protected and conserved.

77. **Site selection of construction work camps, stockpile areas, storage areas, and disposal areas**. Priority is to locate these near the project location. However, if it is deemed necessary to locate elsewhere, sites to be considered will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems. Residential areas will not be considered for setting up construction camps to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). Extreme care will be taken to avoid disposals near forest areas, water bodies, swamps, or in areas which will inconvenience the community.

78. **Site selection of sources of materials**. Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution. To mitigate the potential environmental impacts, locations of quarry site/s and borrow pit/s (for loose material other than stones) would be assessed by PIU. Priority would be sites already permitted by Mines and Geology Department. If new sites are necessary, these would be located away from population centers, drinking water intakes and streams, cultivable lands, and natural drainage systems; and in structurally stable areas. It will be the construction contractor's responsibility to verify the suitability of all material sources and to obtain the approval of Department of Mines & Geology and local revenue administration. If additional quarries will be required after construction is started, then the construction contractor shall use the mentioned criteria to select new quarry sites, with written approval of PIU.

C. Construction Impacts

79. The civil works for the subproject include earth work excavation for pipeline/sewer trenches, pipe/sewer laying, installing valves, flow meters and data loggers, shifting of public utilities and providing house service connections. Earth work excavation will be undertaken by machine (backhoe excavator) and include danger lighting and using sight rails and barricades at every 100 m., while pipe/sewer laying works will include laying pipes/sewer at required gradient, fixing collars, elbows, tees, bends and other fittings including conveying the material to work spot and testing for water tightness.

80. The excavation is done in such a way that there will be a minimum depth of 1.2 m above the water pipe line. The maximum depth for sewers depends on the design, and in Tonk most of the sewers will be laid 1.2 to 2 m below the ground, and some sewers will be laid deeper (> 2m) and maximum depth will be 6m. Sufficient care will be taken while laying so that existing utilities and cables are not damaged and pipes are not thrown into the trenches or dragged, but carefully laid in the trenches. Trenches deeper than 2 m will be protected by bracings to avoid collapse of trenches, and also to avoid any risk to surrounding buildings. Once they are laid, pipes will be joined as per specification and then tested for any cracks of leakages. The minimum working hours will be 8 hours daily, the total duration of each stage depends on the soil condition and other local features. The excavation of trenches for water pipes is estimated to generate 349,100 cubic meters of soil, about 97% of this soil will be used for refilling the trench after placing the pipe and therefore residual soil after pipe laying and refilling is expected to be only 10,350 cubic meters. In case of sewers, estimated soil generation is 403,500 cubic meters, of which about 83% will be used for refilling, and the remaining 67,700 cubic meters needs to be disposed. This soil shall be used for filling low lying area or stored/ dumped in approved debris disposal sites. The beneath and sides of sewers in trench will be filled with sand to form cushion/bed for sewer, and the sand requirement is estimated as 54,264 cubic meter.

81. Although construction of these project components involves quite simple techniques of civil work, the invasive nature of excavation and the project locations in the built-up areas of the town where there are a variety of human activities, will result in impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. These anticipated impacts are temporary and for short duration. Water and sewer lines will be laid on either side of the roads/streets.

82. Physical impacts will be reduced by the method of working and scheduling of work, whereby the project components will be (i) constructed by small teams working at a time; (ii) any excavation done near sensitive area like school, religious places and house will be protected as per standard norms etc.

83. **Sources of Materials**. Significant amount of gravel, sand, coarse aggregate, and cement will be required for this project. The construction contractor will be required to:

(i) Use material sources permitted by government;
(ii) Verify suitability of all material sources and obtain approval of PIU; and
(iii) Submit to PIU on a monthly basis documentation of sources of materials.

84. **Air Quality**. Emissions from construction vehicles, equipment, and machinery used for excavation and construction will induce impacts on the air quality in the construction sites. Anticipated impacts include dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons. These however will be temporary limiting to construction activities only. To mitigate the impacts, construction contractors will be required to:

(i) Consult with PIU/ on the designated areas for stockpiling of, soils, gravel, and other construction materials;
(ii) Damp down exposed soil and any stockpiled material on site by water sprinkling;
(iii) Use tarpaulins to cover sand and other loose material when transported by trucks;
(iv) Clean wheels and undercarriage of haul trucks prior to leaving construction site
(v) Don't allow access in the work area except workers to limit soil disturbance and prevent access by barricading and security personnel
(vi) Fit all heavy equipment and machinery with air pollution control devices which are operating correctly

85. **Surface Water Quality**. Run-off from stockpiled materials, and chemical contamination from fuels and lubricants during construction works can contaminate downstream surface water quality of the streams. These potential impacts are temporary and short-term duration only. However, to ensure that these are mitigated, construction contractor will be required to:

(i) Prepare and implement a spoils management plan (**Appendix 8**);
(ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
(iii) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas;
(iv) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
(v) Place storage areas for fuels and lubricants away from any drainage leading to water bodies;
(vi) Dispose any wastes generated by construction activities in designated sites; and
(vii) Conduct surface quality inspection according to the Environmental Management Plan (EMP).

86. **Noise and Vibration Levels**. Construction works will be conducted along the roads in Tonk urban area, where there are houses, schools and hospitals, religious places and small-scale businesses. The sensitive receptors are the general population in these areas. Increase in noise level may be caused by excavation, particularly breaking of cement concrete or bitumen roads, operation of construction equipment like concrete mixers, and the transportation of equipment, materials, and people. Vibration generated from construction activity, for instance from the use of pneumatic drills, will have impact on nearly buildings. This impact is negative but short-term, and reversible by mitigation measures. The construction contractor will be required to:

(i) Plan activities in consultation with PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;
(ii) Horns should not be used unless it is necessary to warn other road users or animals of the vehicle’s approach;
(iii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimise sound impact to surrounding sensitive receptor; and
(iv) Maintain maximum sound levels not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s.

(v) Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity;
(vi) Consult the custodians of important buildings, cultural and tourism authorities and local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals.

87. **Landscape and Aesthetics**. The construction works does not envisage any cutting of trees, but it will produce excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items. Haphazard disposal of these will have negative impacts on landscape and overall aesthetics. These impacts are negative but are of short-term and reversible by mitigation measures. The construction contractor will be required to:

(i) Prepare and implement spoils management plan;
(ii) Avoid stockpiling of excess excavated soils;
(iii) Coordinate with ULB for beneficial uses of excess excavated soils or immediately dispose to designated areas;
(iv) Recover used oil and lubricants and reuse or remove from the sites;
(v) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
(vi) Remove all wreckage, rubbish, or temporary structures which are no longer required; and
(vii) Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.

88. **Surface and Groundwater Quality**. Another physical impact that is often associated with excavation is the effect on drainage and the local water table if groundwater and surface water collect in the voids. In Tonk groundwater is much deeper than the proposed trenching depth, and rains are scarce and limited to very short duration during monsoon. However, to ensure that water will not pond in pits and voids near project location, the construction contractor will be required to conduct excavation works in non-monsoon season to the maximum extent possible.

89. **Accessibility**. Excavation along the roads, hauling of construction materials and operation of equipment on-site can cause traffic problems. Potential impact is negative but short term and reversible by mitigation measures. The construction contractor will be required to:

(i) Prepare and implement a Traffic Management Plan (**Appendix 9**)
(ii) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
(iii) Schedule transport and hauling activities during non-peak hours;
(iv) Locate entry and exit points in areas where there is low potential for traffic congestion;
(v) Keep the site free from all unnecessary obstructions;
(vi) Drive vehicles in a considerate manner;
(vii) Coordinate with Traffic Police for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours; and
(viii) Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.

90. Wherever road width is minimal, there will be temporary loss of access to restrains

and vehicular traffic (including 2-wheelers) during the laying of pipes. Under those circumstances, contractor shall adopt following measures:

(i) Inform the affected local population 1-week in advance about the work schedule
(ii) Plan and execute the work in such a way that the period of disturbance/ loss of access is minimum.
(iii) Provide pedestrian access in all the locations until normalcy is restored. Provide wooden/metal planks over the open trenches at each house to maintain the access.

91. **Socio-Economic – Income**. The project components will be located in government land and there is no requirement for land acquisition or any resettlement. Construction works will impede the access of residents to specific site in limited cases. The potential impacts are negative and moderate but short-term and temporary. The construction contractor will be required to:

(i) Prepare and implement spoils management plan (**Appendix 8**);
(ii) Leave spaces for access between mounds of soil;
(iii) Provide walkways and metal sheets where required to maintain access across for people and vehicles;
(iv) Increase workforce in the areas with predominantly institutions, place of worship, business establishment, hospitals, and schools;
(v) Consult businesses and institutions regarding operating hours and factoring this in work schedules; and
(vi) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.
(vii) Notify community/ water users in advance about likely interruptions in water supply.
(viii) Provide alternate sources of clean water until water supply is restored.

92. **Socio-Economic – Employment**. Manpower will be required during the 36-months construction stage. This can result in generation of temporary employment and increase in local revenue. Thus potential impact is positive and long-term. The construction contractor will be required to:

(i) Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; and
(ii) Secure construction materials from local market.

93. **Occupational Health and Safety**. Workers need to be mindful of the occupational hazards which can arise from working in height and excavation works. Potential impacts are negative and long-term but reversible by mitigation measures. The construction contractor will be required to:

(i) Comply with all national, state and local labor laws (see **Appendix 7**);
(ii) Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment; (c) OH&S Training[4] for all site personnel; (d) documented

[4] Some of the key areas that may be covered during training as they relate to the primary causes of accidents include (i) slips, trips and falls; (ii) personal protective equipment; (iii) ergonomics, repetitive motion, and manual handling; (iv) workplace transport; and (v) legislation and responsibilities. Training can provide the foundations of competence but it does not necessarily result in a competent worker. Therefore, it is essential to

procedures to be followed for all site activities; and (e) documentation of work-related accidents;

(iii) Ensure that qualified first-aid is provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;

(iv) Provide medical insurance coverage for workers;

(v) Secure all installations from unauthorized intrusion and accident risks;

(vi) The project area experiences extreme temperature during summer months of April and May, which may affect the health of workers engaged in construction work. Contractor should take necessary measures during summers including the following:

a. Work schedule should be adjusted to avoid peak temperature hours (12 – 3 PM)

(vii) Provide appropriate shade near the work place; allow periodic resting and provide adequate water

(viii) Provide necessary medicine and facilities to take care of dehydration related health issues

(ix) Provide supplies of potable drinking water;

(x) Provide clean eating areas where workers are not exposed to hazardous or noxious substances;

(xi) Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;

(xii) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;

(xiii) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;

(xiv) Ensure moving equipment is outfitted with audible back-up alarms;

(xv) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and

(xvi) Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

94. **Asbestos Materials.** Existing water distribution network is mostly asbestos cement (AC) pipes, and because of the health risks these will be left in situ and replaced by new pipes. Details will be obtained from the PHED of the nature and location of all water supply infrastructure, and planning pipeline alignments carefully to avoid any conflict or damage. Given the dangerous nature of this material for both workers and citizens, additional measure should be taken to protect the health of all parties in the event (however unlikely) that AC pipes are encountered. This is that, prior to start of construction works of water supply system, PIU will develop a protocol to be applied in any instance that AC pipes are encountered, to ensure that appropriate action is taken. This should be based on the approach recommended by the United States Environmental Protection Agency (USEPA),[5]

assess staff competence to ensure that the training provided is relevant and effective. Supervision and monitoring arrangements shall be in place to ensure that training has been effective and the worker is competent at their job. The level of supervision and monitoring required is a management decision that shall be based on the risks associated with the job, the level of competence required, the experience of the individual and whether the worker works as part of a team or is a lone worker.

[5] In the USA, standards and approaches for handling asbestos are prescribed by the Occupational Health and Safety Administration (OHSA) and the Environmental Protection Agency (EPA) and can be found at

and amongst other things, should involve:

(i) Training of all personnel (including manual labourers) to enable them to understand the dangers of AC pipes and to be able to recognise them in situ;
(ii) Reporting procedures to inform PIU immediately if AC pipes are encountered;
(iii) Development and application of a detailed H&S procedure to protect both workers and citizens. This should comply with national and international standards for dealing with asbestos, and should include: (a) removal of all persons to a safe distance; (b) usage of appropriate breathing apparatus and protective equipment by persons delegated to deal with the AC material; and (c) Procedures for the safe removal and long-term disposal of all asbestos-containing material encountered.

95. **Community Health and Safety**. Hazards posed to the public, specifically in high-pedestrian areas may include traffic accidents and vehicle collision with pedestrians. Potential impact is negative but short-term and reversible by mitigation measures. The construction contractor will be required to:

(i) Plan routes to avoid times of peak-pedestrian activities.
(ii) Liaise with PIU in identifying risk areas on route cards/maps.
(iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.
(iv) Provide road signs and flag persons to warn of on-going trenching activities.

96. Central part of the town is characterized by narrow roads. Particularly, the areas located on hill slopes have very narrow roads with sharp turns and are accessible only to pedestrians. Besides impeding the access, the trench excavation and pipe laying will pose safety risks to pedestrians, and the people living in these areas. Though the width (<500 mm) and depth (<750 mm) of trench is minimal, it will pose safety risk, especially for children and elders The construction contractor will be required to:

(i) Provide prior information to the local people about the nature and duration of work
(ii) Conduct awareness program on safety during the construction work
(iii) Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day
(iv) Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches

97. **Work Camps**. Operation of work camps can cause temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants. Potential impacts are negative but short-term and reversible by mitigation measures. The construction contractor will be required to:

(i) Consult PIU before locating project offices, sheds, and construction plants;
(ii) Minimize removal of vegetation and disallow cutting of trees;
(iii) Provide drinking water, water for other uses, and sanitation facilities for employees;
(iv) Ensure conditions of liveability at work camps are maintained at the highest standards possible at all times;
(v) Prohibit employees from poaching wildlife and cutting of trees for firewood;

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http://www.osha.gov/SLTC/asbestos

(vi) Train employees in the storage and handling of materials which can potentially cause soil contamination;
(vii) Recover used oil and lubricants and reuse or remove from the site;
(viii) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
(ix) Remove all wreckage, rubbish, or temporary structures which are no longer required; and
(x) Request PMU to report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.

98. **Social and Cultural Resources**. For this project, excavation will occur at locations known not to have archaeological values, so it could be that there is a low risk of such impacts. Nevertheless, the construction contractor will be required to:

(i) Strictly follow the protocol for chance finds in any excavation work;
(ii) Request PIU or any authorized person with archaeological/historical field training to observe excavation;
(iii) Stop work immediately to allow further investigation if any finds are suspected;
(iv) Inform PIU/ACM if a find is suspected, and take any action they require ensuring its removal or protection in situ.
(v) Adjacent to religious/historic sites, undertake excavation and construction work in such a way that no structural damage is caused to the building.

99. **Debris disposal.** Prior to the commencement of works, contractor shall identify a debris disposal site in consultation with the PIU and adhering to following criteria:

(i) The site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, top-soil stripping, stacking and preservation should be undertaken prior to initiation of any activities.
(ii) Debris disposal site shall be at least 200 m away from surface water bodies[6].
(iii) No residential areas shall be located within 100 m downwind side of the site.
(iv) The site is minimum 250 m. away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies.
(vi) The local governing body and community shall be consulted while selecting the site.

D. Operation and Maintenance Impacts

100. Operation and Maintenance of the water supply system will be carried out by Tonk Nagar Parishad directly or through an external operator. The system have a design life of 15/30 years, during which shall not require major repairs or refurbishments and should operate with little maintenance beyond routine actions required to keep the equipment in working order. The stability and integrity of the system will be monitored periodically to detect any problems and allow remedial action if required. Any repairs will be small-scale involving manual, temporary, and short-term works involving regular checking and recording of performance for signs of deterioration, servicing and replacement of parts.

101. Recurrence of pipe bursting and leakage problems can be managed by the leak detection and water auditing surveys. The ULB will be required to ensure that the leak

[6] In the absence of site meeting the stipulated criteria, an alternate site can be selected specifying the reasons. In such a case, the construction camp management plan should incorporate additional measures specific to the site as suggested by the Construction Manager.

detection and rectification time is minimized.

102. Improper disposal of silt and debris removed from trenches could cause inconvenience to public. Silt and debris shall be collected in trucks and transported to the approved disposal site and or can be used as covering material for wastes being landfilled.

103. Repair works could cause some temporary disruption of activities at locations of social and cultural importance such as schools, hospitals, churches, tourist sites etc., so the same precautions as employed during the construction period should be adopted. ULB needs to:

(i) Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity;
(ii) Complete work in these areas quickly;
(iii) Consult the custodians of important buildings, cultural and tourism authorities and local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals.

104. There are also certain environmental risks from the operation of the sewer system, most notably from leaking sewer pipes as untreated faecal material can damage human health and contaminate both soil and groundwater. It will be imperative therefore that the operating agency establishes a procedure to routinely check the operation and integrity of the sewers, and to implement rapid and effective repairs where necessary. There is an occupation health risk to workers engaged in sewer maintenance activities. Following measures should be followed:

(i) Establish regular maintenance program, including:
- Regular cleaning of grit chambers and sewer lines to remove grease, grit, and other debris that may lead to sewer backups. Cleaning should be conducted more frequently for problem areas.
- Inspection of the condition of sanitary sewer structures and identifying areas that need repair or maintenance. Items to note may include cracked/deteriorating pipes; leaking joints or seals at manhole; frequent line blockages; lines that generally flow at or near capacity; and suspected infiltration or exfiltration; and
- Monitoring of sewer flow to identify potential inflows and outflows
- Conduct repairs on priority based on the nature and severity of the problem. Immediate clearing of blockage or repair is warranted where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, or sewer line blockages);

(ii) Review previous sewer maintenance records to help identify “hot spots” or areas with frequent maintenance problems and locations of potential system failure, and conduct preventative maintenance, rehabilitation, or replacement of lines as needed;
(iii) When a spill, leak, and/or overflow occurs, keep sewage from entering the storm drain system by covering or blocking storm drain inlets or by containing and diverting the sewage away from open channels and other storm drain facilities (using sandbags, inflatable dams, etc.). Remove the sewage using vacuum equipment or use other measures to divert it back to the sanitary sewer system.
(iv) Prohibit/prevent disposal of wastewater/effluent from industrial units in the sewers; ensure regular checking to ensure no illegal entry of industrial wastewater into sewers
(v) Develop an Emergency Response System for the sewerage system leaks,

burst and overflows, etc.

(vi) Provide necessary health & safety training to the staff in sewer cleaning & maintenance

(vii) Provide all necessary personnel protection equipment

(viii) For personnel cleaning underground sewers there is a risk due to oxygen deficiency and harmful gaseous emissions (hydrogen sulphide, carbon monoxide, methane, etc.); provide for adequate equipment (including oxygen masks) for emergency use

105. Treated wastewater will meet the national effluent standards (Appendix 4) and recycled for irrigation. Inert sewage sludge can also be used as a farm fertilizer. The reuse of wastewater and sludge should be preceded by bacteriological tests to confirm that the treatment methods render all dried sludge and effluent free from enteric bacteria and pathogens, so that it is safe to humans, animals and crops.

106. The citizens of the Tonk Municipal Council will be the major beneficiaries of the improved water supply and sewerage, as they will be provided with a constant supply of better quality water, piped into their homes and the human waste from the homes will be removed rapidly and treated to acceptable standard. In addition to improved environmental conditions, the project will improve the over-all health condition of the town as diseases of poor sanitation will be reduced. This should improve the environment, should deliver major improvements in individual and community health and well-being. Diseases of poor sanitation, such as diarrhea and dysentery, should be reduced, so people should spend less on healthcare and lose fewer working days due to illness, so their economic status should also improve, as well as their overall health.

V. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Overview

107. The active participation of stakeholders including local community, NGOs/CBOs, and the media in all stages of project preparation and implementation is essential for successful implementation and as well as operation of the project. It will ensure that the subprojects are designed, constructed, and operated with utmost consideration to local needs, ensures community acceptance, and will bring maximum benefits to the people. Public consultation and information disclosure is a must as per the ADB policy.

108. A three tier consultation process has been adopted for RUSDP: Focus group discussions, primary household sample surveys and a town-level public consultation workshop. Most of the main stakeholders have already been identified and consulted during preparation of this IEE, and any others that are identified during project implementation will be brought into the process in the future. Primary stakeholders of the subproject are: residents, shopkeepers and businesspeople who live and work alongside the roads in which network improvements will be provided and near sites where facilities will be built (STP), and government and utility agencies responsible for provision of services Tonk Nagar Parishad, Public Health Engineering Department, Department of Archeology and Museums and Rajasthan Pollution Control Board. Secondary stakeholder are: NGOs and CBOs working in the area, community representatives, beneficiary community in general, government agencies, the executing and implementing agencies (LSGD and RUIDP), Government of India and the ADB.

B. Public Consultation

109. The public consultation and disclosure program is a continuous process throughout the project implementation, including project planning, design and construction. Socio

economic surveys were conducted in June-August, 2013. Women groups were consulted in April and May, 2014 (Appendix 11).

1. Consultation during Project Preparation

110. Institutional consultations were conducted with the Governmental Departments such as Local Self Government Department, Public Works Department, Pollution Control Board, Public Health Engineering Department, Tonk Nagar Parishad, etc. The project proposals are formulated in consultation with PHED and Tonk Nagar Parishad and the proposals will be finalized only after certification of Commissioner Tonk NP that the proposals suit the requirements of the ULB.

111. Focus-group discussions with affected persons and other stakeholders were conducted to learn their views and concerns. A socio economic household survey has been conducted in the town, covering sample households, to understand the household characteristics, health status, and the infrastructure service levels, and also the demand for infrastructure services. General public and the people residing along the project activity areas were also consulted during visits to the project sites.

112. It was observed that people are willing to extend their cooperation as the proposed activities are proposed to enhance the infrastructure service levels and the living standard of the public. The public expressed their concern regarding the nuisance and disturbance (dust, road closure and traffic management activities) during the construction stage which can have impact on their day to day activities. Public demanded for advance notice before construction and proper warning signs along the construction area to avoid accidents and inconvenience. Public opined that an appropriate operation and maintenance system should be in place, especially for sewerage system, for its best functioning and to have the maximum health and aesthetic benefits.

113. A stakeholder consultation meeting was conducted in Tonk Town on April 30, 2014 to which representatives of primary and secondary stakeholders were invited. Participants were be invited to understand the project and likely environment and social issues, benefits, and to express their views and concerns. Proceedings of the stakeholder consultation meeting is at Appendix 14. Stakeholders are supportive of the project, and opined that this project will improve the quality of life in the town, and will benefit them immensely.

2. Consultation during construction

114. Prior to start of construction, ULB and PIU with the assistance of PMDSC will conduct information dissemination sessions at major intersections and solicit the help of the local community leaders/prominent citizens to encourage the participation of the people to discuss various environmental issues. At each ward/neighborhood level, focus group meetings will be conducted to discuss and plan construction work with local communities to reduce disturbance and other impacts, and provide a mechanism through which stakeholders can participate in project monitoring and evaluation.

115. A constant communication will be established with the affected communities to redress the environmental issues likely to surface during construction and operational phases and also regarding the grievance redress mechanism. ULB/PIU and PMDSC will organize public meetings and will appraise the communities about the progress on the implementation of EMP. Meeting will also be organized at the potential hotspots/sensitive locations before and during the construction.

C. Information Disclosure

116. Executive summary of the IEE will be translated in the local language and made available at the offices of RUIDP, PMU and PIU. Copies of summary will be provided to participants of city level workshop to be organized in Tonk. Hard copies of the IEE will be accessible to citizens as a means to disclose the document and at the same time creating wider public awareness. Electronic version of the IEE in English and Executive Summary in Hindi will be placed in the official website of the ULB/RUIDP after approval of the IEE by Government and ADB. Stakeholders will also be made aware of grievance register and redress mechanism.

117. Public information campaigns via newspaper/radio/TV, to explain the project details to a wider population will be conducted. Public disclosure meetings will be conducted at key project stages to inform the public of progress and future plans. Prior to start of construction, the PIU will issue Notification on the start date of implementation in local newspapers A board showing the details of the project will be displayed at the construction site for the information of general public.

118. Local communities will be continuously consulted regarding location of construction camps, access and hauling routes and other likely disturbances during construction. The road closure together with the proposed detours will be communicated via advertising, pamphlets, radio broadcasts, road signage, etc.

VI. GRIEVANCE REDRESS MECHANISM

A. Project Specific Grievance Redress Mechanism

119. A project-specific grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate the resolution of AP's concerns, complaints, and grievances about the social and environmental performance at the level of the project. The GRM will aim to provide a time-bound and transparent mechanism to record and resolve social and environmental concerns linked to the project.

120. **Common GRM**. A common GRM will be in place for social, environmental, or any other grievances related to the project; the resettlement plans (RPs) and IEEs will follow the GRM described below. The GRM will provide an accessible and trusted platform for receiving and facilitating resolution of affected persons' grievances related to the project. The multi-tier GRM for the project is outlined below, each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required.

121. ULB-wide public awareness campaigns will ensure that awareness on grievance redress procedures is generated through the campaign. PIU Assistant Safeguards Officer (ASO) through Community Awareness and Participation Consultant (CAPC) will conduct ULB-wide awareness campaigns to ensure that poor and vulnerable households are made aware of grievance redress procedures and entitlements.

122. APs will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaints/suggestion boxes will be installed by project ULBs or by e-mail, by post, or by writing in a complaints register in ULB/PIU offices. **Appendix 11** has the sample grievance registration form. Careful documentation of the name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved will be undertaken. The PMU Project Officers (Environment & Social) will have the overall responsibility for timely grievance redressal respectively on environmental and social safeguards issues and

for registration of grievances, related disclosure, and communication with the aggrieved party through the PIU ASO.

B. Grievance Redress Process

123. In case of grievances that are immediate and urgent in the perception of the complainant, the contractor, and supervision personnel from PIU and PMDSC on-site will provide the most easily accessible or first level of contact for quick resolution of grievances. Contact phone numbers and names of the concerned PIU Assistant Safeguards Officer, contractors, will be posted at all construction sites at visible locations.

(i) **1st level grievance**. The contractors, PIU supervision personnel, PIU Assistant Safeguards Officer and implementing NGO/CAPC[7] can immediately resolve issues on-site in consultation with each other, and will be required to do so within 3 days of receipt of a complaint/grievance.

(ii) **2nd level grievance**. All grievances that cannot be redressed within 3 days at field/ward level will be brought to the notice of respective Project Officers (Environment/Social) of PMU. PMU POs will resolve the grievance within 7 days of receipt of compliance/grievance in discussion with the PIU, CAPC and the Contractor. PMDSC will assist POs in resolving the issue.

(iii) **3rd level grievance**. All the grievances that are not addressed by PMU within in 7 days of receipt will be brought to the notice of notice of the Grievance Redressal Committee (GRC). The City Level Committee (CLC) that will be established in every project town will act as GRC[8]. GRC will meet twice a month and determine the merit of each grievance brought to the committee. The PIU ASO will be responsible to see through the process of redressal of each grievance. The GRC will resolve the grievance within 15 days of receiving the complaint.

(iv) **4th level grievance**. Very major issues that are beyond the jurisdictional authority of the CLC or those that have the potential to cause social conflicts or environmental damage or those that remain unresolved at PMU/CLC level, will be referred to the Empowered Committee (EC)[9]. All decisions taken by the GRC and PSC will be communicated to the APs by the PIU ASO.

124. The project GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage, and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM. Alternatively, if the grievance is related to land acquisition, resettlement & rehabilitation, the APs can approach the Land Acquisition, Rehabilitation and Resettlement Authority (LARRA). As per the latest Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation, and Resettlement Act, 2013, the state government will have to establish the LARRA to address grievances in implementation of LARRA.

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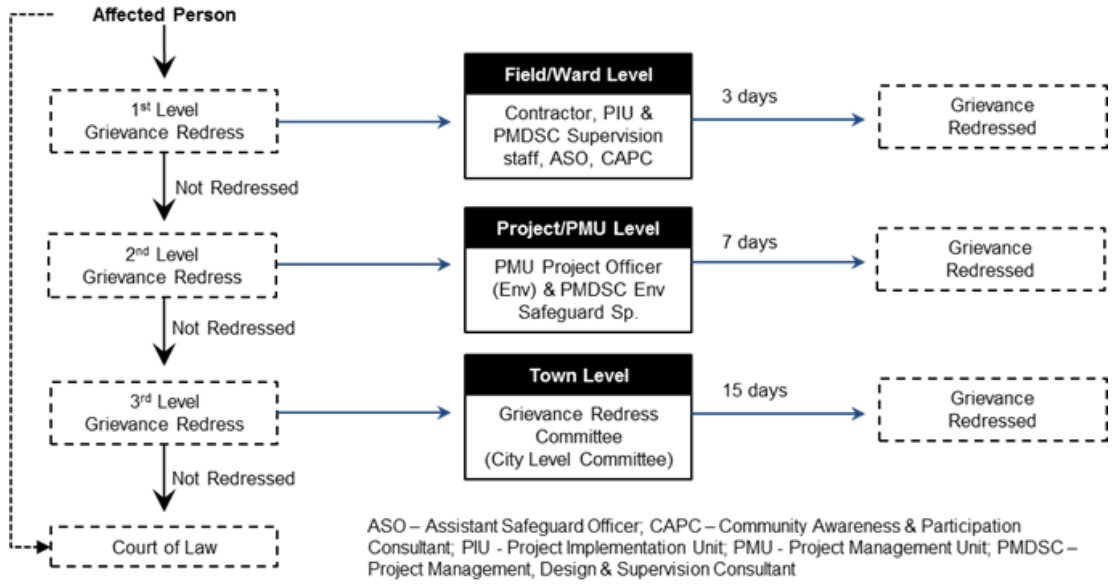
[7] Community Awareness and Public Participation (CAPC) will oversee the matters if there is no Resettlement Plan (RP) Implementing NGO

[8] City Level Committees (CLC) will be formed at town-level with members composed of: District Collector (DC) as Chairperson, and following as members: ULB Commissioner; Assistant Safeguards Officer PIU; representative from RPCB regional office; and one representative each from relevant government departments as appropriate (PWD / PHED / DAM etc). All town-level GRCs will have at least one woman member/chairperson. In addition, for project-related grievances, representatives of APs, community-based organizations (CBOs), and eminent citizens will be invited as observers in GRC meetings

[9] The Empowered Committee (EC) will be chaired by the Minister of Urban Development and Housing, and members will include Ministers, Directors and/or representatives of other relevant Government Ministries and Departments

125. In the event that the established GRM is not in a position to resolve the issue, the affected person also can use the ADB Accountability Mechanism through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB India Resident Mission (INRM). The complaint can be submitted in any of the official languages of ADB's DMCs. The ADB Accountability Mechanism information will be included in the PID to be distributed to the affected communities, as part of the project GRM.

Figure 7: Grievance Redressal Process



VII. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

126. The following tables show the potential environmental impacts, proposed mitigation measures and responsible agencies for implementation and monitoring.

127. The purpose of the environmental management plan (EMP) is to ensure that the activities are undertaken in a responsible, non-detrimental manner with the objectives of: (i) providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the project; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the project; and (iv) ensuring that safety recommendations are complied with.

128. A copy of the EMP must be kept at work sites at all times. This EMP will be included in the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

129. For civil works, the contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to

monitor implementation of this IEE and EMP. The contractor shall allocate budget for compliance with these EMP measures, requirements and actions.

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Table 5: Design Stage Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Cost and Source of Funds
Design of Sewage Treatment Plant	Treated effluent not meeting the disposal standards and associated impacts on receiving environment	(i) STP design to meet CPCB wastewater disposal standards into inland water bodies (ref Appendix 4for detailed parameters) including: • BOD less than 30 mg/l • Suspended solids less than 100 mg/l • Faecal coliform less than 1000/100 ml	PIU / PMU	Project Costs
	Impairment of STP treatment efficiency	(i) Ensure continuous uninterrupted power supply (ii) Provide back-up facility (such as generator) and make sure that adequate fuel supplies during operation for running of generator when required; (iii) Provide operating manual with all standard operating procedures (SOPs) for operation and maintenance of the facility; this should include guidance on the follow up actions in case of process disruptions, inferior quality of treated water; etc. Necessary training (hands-on and class room / exposure visits) shall be provided to the ULB staff dealing with STP. (iv) The scope of work of facility contractor should include extended operation period (at least five years) to ensure smooth operation, training to the ULB staff and transfer of facility to Tonk Nagar Parishad	PIU / PMU	Project Costs
	Mixing of industrial effluent with sewage	(i) No industrial wastewater shall be allowed to dispose into municipal sewers (ii) No domestic wastewater from industrial units shall be allowed into municipal sewers (iii) Ensure that there is no illegal discharge through manholes or inspection chambers (iv) Conduct public awareness programs; in coordination with RPCB, issue notice to all industries for compliance (v) Conduct regular wastewater quality monitoring (at inlet and at outlet of STP) to ensure that the treated effluent quality complies with the standards	PIU / PMU	Project Costs

Table 6: Environmental Management Plan of Anticipated Impacts during Pre-Construction

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
Compliance with environmental subproject selection criteria	Environmental impacts due to subproject	Compliance with environmental subproject selection criteria A compliance checklist is appended to this report (Appendix 8)	PIU and Tonk Nagar Parishad	PMU	No costs required
Utilities	Telephone lines, electric poles and wires, water lines within proposed project area	(i) Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and (ii) Require construction contractors to prepare a contingency plan to include actions to be taken in case of unintentional interruption of services. (iii) Require contractors to prepare spoils management plan (**Appendix 8**) and traffic management plan (**Appendix 9**)	Contractor in collaboration with PIU and with approval of PMU	(i) List of affected utilities and operators; (ii) Bid document to include requirement for a contingency plan for service interruptions (example provision of water if disruption is more than 24 hours), spoil management plan (**Appendix 8**), and traffic management plan (**Appendix 9**)	No cost required. Mitigation measures are part of TOR of PMU, PIU and PMDSC
Social and Cultural Resources	Ground disturbance can uncover and damage archaeological and	(i) Consult Dept. of Archeology and museums, Government of	PIU	Chance Finds Protocol	No cost required. Mitigation measures are part of TOR of

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
	historical remains	Rajasthan to obtain an expert assessment of the archaeological potential of the site; (ii) Consider alternatives if the site is found to be of medium or high risk; (iii) Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.			PIU and PMDSC
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Disruption to traffic flow and sensitive receptors	(i) Prioritize areas within or nearest possible vacant space in the project location; (ii) If it is deemed necessary to locate elsewhere, consider sites that will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems; (iii) Do not consider residential areas; (iv) Take extreme care in selecting sites to	Contractor to finalize locations in consultation and approval of PIU	(i) List of selected sites for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas. (ii) Written consent of landowner/s (not lessee/s) for reuse of excess spoils to agricultural land	No cost required. Mitigation measures are part of TOR of PIU and PMDSC and also part of contractual terms

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		avoid direct disposal to water body which will inconvenience the community. (v) For excess spoil disposal, ensure (a) site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, written consent from landowners (not lessees) will be obtained; (b) debris disposal site shall be at least 200 m away from surface water bodies; (c) no residential areas shall be located within 50 m downwind side of the site; and (d) site is minimum 250 m away from sensitive locations like settlements, ponds/lakes or other water bodies.			
Sources of Materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water	(i) Prioritize sites already permitted by the Department of Mines and Geology (ii) If other sites are necessary, inform construction contractor that it is	Contractor to prepare list of approved quarry sites and sources of materials with the approval of PIU	(i) List of approved quarry sites and sources of materials; (ii) Bid document to include requirement for verification of suitability of sources	No cost required. Mitigation measures are part of TOR of PIU and PMDSC and also part of contractual terms

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
	logging, and water pollution.	their responsibility to verify the suitability of all material sources and to obtain the approval of PMU and (iii) If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from PIU.		and permit for additional quarry sites if necessary.	
Consents, permits, clearances, NOCs, etc.	Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	(i) Obtain all necessary consents, permits, clearance, NOCs, etc. prior to award of civil works. (ii) Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction (iii) Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. (iv) Include in detailed design drawings and documents all conditions and provisions if necessary	PIU and PMDSC	Incorporated in final design and communicated to contractors.	No cost required. Cost of obtaining all consents, permits, clearance, NOCs, etc. prior to start of civil works responsibility of PIU. Mitigation measures are part of TOR of PIU and PMDSC
Asbestos Cement Pipes	Health risk due to exposure to asbestos	(i) Obtain details from PHED on location of	PIU and PMDSC	(i) Detailed construction drawings	No cost required.

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
	materials	underground AC pipes (ii) Locate the new pipe/sewer carefully to avoid encountering AC pipes (ii) Leave the AC pipes undisturbed in the ground.		showing alignment of AC pipes	Mitigation measures are part of TOR of PIU and PMDSC

Table 7: Environmental Management Plan of Anticipated Impacts during Construction

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
EMP Implementation Training	Irreversible impact to the environment, workers, and community	(i) Project manager and all key workers will be required to undergo EMP implementation including spoils management, Standard operating procedures (SOP) for construction works; occupational health and safety (OH&S), core labor laws, applicable environmental laws, etc.	Construction Contractor	(i) Certificate of Completion (Safeguards Compliance Orientation) (ii) Posting of Certification of Completion at worksites (iii) Posting of EMP at worksites	Cost of EMP Implementation Orientation Training to contractor is responsibility of PMU. Other costs responsibility of contractor.
Air Quality	Emissions from construction vehicles, equipment, and machinery used for installation of pipelines resulting to dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter,	(i) Consult with PIU on the designated areas for stockpiling of clay, soils, gravel, and other construction materials; (iii) Damp down exposed soil and any stockpiled material on site by water sprinkling necessary during dry weather; (iv) Use tarpaulins to cover sand and other loose material when transported by trucks; and (v) Fit all heavy equipment and machinery with air pollution	Construction Contractor	(i) Location of stockpiles; (ii) Complaints from sensitive receptors; (iii) Heavy equipment and machinery with air pollution control devices; (iv) Certification that vehicles are compliant with Air Act	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	nitrous oxides, and hydrocarbons.	control devices which are operating correctly.			
Surface water quality	Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during installation of pipelines can contaminate nearby surface water quality.	(i) Prepare and implement a spoils management plan (Appendix 4) (ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; (ii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; (iii) Place storage areas for fuels and lubricants away from any drainage leading to water bodies; (iv) Dispose any wastes generated by work in designated sites; and (v) Conduct surface quality inspection according to the Environmental Management Plan (EMP).	Construction Contractor	(i) Areas for stockpiles, storage of fuels and lubricants and waste materials; (ii) Number of silt traps installed along trenches leading to water bodies; (iii) Records of surface water quality inspection; (iv) Effectiveness of water management measures; (v) No visible degradation to nearby drainages, nallahs or water bodies due to civil works	Cost for implementation of mitigation measures responsibility of contractor.
Noise Levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people	(i) Plan activities in consultation with PIU/PMDSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; (ii) Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; (iii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing	Construction Contractor	(i) Complaints from sensitive receptors; (ii) Use of silencers in noise-producing equipment and sound barriers; (iii) Equivalent day and night time noise levels (see **Appendix 3** of this IEE)	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and (iv) Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s.			
Landscape and aesthetics	Impacts due to excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items.	(i) Prepare and implement spoils management plan (**Appendix 8**); (ii) Avoid stockpiling of excess excavated soils; (iii) Coordinate with ULB/PIU for beneficial uses of excess excavated soils or immediately dispose to designated areas; (iv) Recover used oil and lubricants and reuse or remove from the sites; (v) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; (vi) Remove all wreckage, rubbish, or temporary structures which are no longer required; and (vii) Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.	Construction Contractor	(i) Complaints from sensitive receptors; (ii) Worksite clear of hazardous wastes such as oil/fuel (iiv) Worksite clear of any excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers	Cost for implementation of mitigation measures responsibility of contractor.
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure at specified project	(i) Obtain from PIU the list of affected utilities and operators if any; (ii) Prepare a contingency plan to include actions to be done in	Construction Contractor	Existing Utilities Contingency Plan	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	location	case of unintentional interruption of service			
Ecological Resources – Terrestrial	Loss of vegetation and tree cover	(i) Minimize removal of vegetation and disallow cutting of trees; (ii) If tree-removal will be required, obtain tree-cutting permit from the Revenue Department; and (iii) Plant two native trees for every one that is removed.	Construction Contractor	PIU to report in writing the no of trees cut and planted.	Cost for implementation of mitigation measures responsibility of contractor.
Land use	Environmental Issues due to land use change	The impact due to change in land use will be negligible due to this project.	Not applicable	Not applicable	Not applicable
Accessibility	Traffic problems and conflicts near project locations and haul road	(i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites; (ii) Schedule transport and hauling activities during non-peak hours; (iii) Locate entry and exit points in areas where there is low potential for traffic congestion; (iv) Keep the site free from all unnecessary obstructions; (v) Drive vehicles in a considerate manner; (vi) Coordinate with Traffic Police for temporary road diversions and with for provision of traffic aids if transportation activities cannot be avoided during peak hours; (vii) Notify affected sensitive receptors 1-week in advance by providing sign boards informing nature and duration of	Construction Contractor	(i) Traffic route during construction works including number of permanent signages, barricades and flagmen on worksite (**Appendix 9**); (ii) Complaints from sensitive receptors; (iii) Number of signages placed at project location.	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		construction works and contact numbers for concerns/complaints. (viii) Plan and execute the work in such a way that the period of disturbance/ loss of access is minimum. (ix) Provide pedestrian access in all the locations until normalcy is restored.			
Socio-Economic – Income.	Impede the access of residents and customers to nearby shops	(i) Prepare and implement spoils management plan (**Appendix 8**) (ii) Leave spaces for access between mounds of soil; (ii) Provide walkways and metal sheets where required for people; (iii) Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools; (iv) Consult businesses and institutions regarding operating hours and factoring this in work schedules; and (v) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.	Construction Contractor	(i) Complaints from sensitive receptors; (ii) Spoils management plan (iii) Number of walkways, signages, and metal sheets placed at project location.	Cost for implementation of mitigation measures responsibility of contractor.
Socio-Economic - Employment	Generation of temporary employment and increase in local revenue	(i) Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; (ii) Secure construction materials from local market. (iii) Comply with labor laws	Construction Contractor	(i) Employment records; (ii) Records of sources of materials (iii) Compliance to labor laws (see **Appendix 7** of this IEE)	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Occupational Health and Safety	Occupational hazards which can arise during work	(i) Comply with all national, state and local core labor laws (see **Appendix 7** of this IEE) (ii) Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment like helmet, gumboot, safety belt, gloves, nose musk and ear plugs; (c) OH&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; (ii) Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site; (iii) Provide medical insurance coverage for workers; (iv) Secure all installations from unauthorized intrusion and accident risks; (v) Provide supplies of potable drinking water; (vi) The project area experiences extreme temperature during summer months of April and May, which may affect the health of workers engaged in construction work. Contractor should take necessary measures during	Construction Contractor	(i) Site-specific OH&S Plan; (ii) Equipped first-aid stations; (iii) Medical insurance coverage for workers; (iv) Number of accidents; (v) Supplies of potable drinking water; (vi) Clean eating areas where workers are not exposed to hazardous or noxious substances; (vii) record of H&S orientation trainings (viii) personal protective equipment; (ix) % of moving equipment outfitted with audible back-up alarms; (xi) permanent sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. (xii) Compliance to core labor laws (see **Appendix 7** of this IEE)	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		summers including the following: (a) work schedule should be adjusted to avoid peak temperature hours (12 – 3 PM); (b) provide appropriate shade near the work place; allow periodic resting and provide adequate water, and (c) provide necessary medicine and facilities to take care of dehydration related health issues (vii) Provide clean eating areas where workers are not exposed to hazardous or noxious substances; (viii) Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; (ix) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; (x) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; (xi) Ensure moving equipment is outfitted with audible back-up alarms;			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(xii) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; (xiii) Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively; and (xiv) Provide proper solid and liquid waste management program in the workers' campsite, separate from spoils and debris disposal, as their presence can add to existing waste volume at the project sites.			
Asbestos Cement (AC) Materials	Health risks associated with AC pipes	(i) Left AC pipes in-situ. (ii) Training of all personnel (including manual labourers) to enable them to understand the dangers of AC pipes and to be able to recognize them in situ; (iii) Reporting procedures to inform management immediately if AC pipes are encountered; (iv) Development and application of a detailed OH&S procedure to	Construction Contractor	(i) Site-specific OH&S Plan including AC pipe protocol (iii) record of OH&S orientation on AC Cement Materials Protocol (iv) personal protective equipment for AC materials (v) sign boards for pipe	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		protect both workers and citizens. This should comply with national and international standards for dealing with asbestos, and should include: (a) removal of all persons to a safe distance; (b) usage of appropriate breathing apparatus and protective equipment by persons delegated to deal with the AC material; and (c) Procedures for the safe removal and long-term disposal of all asbestos- containing material encountered.		alignment identified as AC pipes.	
Community Health and Safety.	Traffic accidents and vehicle collision with pedestrians during material and waste transportation	(i) Plan routes to avoid times of peak-pedestrian activities. (ii) Liaise with PIU/ULB in identifying high-risk areas on route cards/maps. (iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure. (iv) Provide road signs and flag persons to warn of on-going trenching activities.	Construction Contractor	(i) Traffic Management Plan; (ii) Complaints from sensitive receptors	Cost for implementation of mitigation measures responsibility of contractor.
Safety of sensitive groups (children, elders etc.) and others pedestrians in narrow streets	Trench excavation in in narrow streets will pose high risk to children and elders in the locality	(i) Provide prior information to the local people about the nature and duration of work (ii) Conduct awareness program on safety during the construction work (iii) Undertake the construction work stretch-wise; excavation, pipe laying and	Construction Contractor	Complaints from neighborhood and monitoring of accidents	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		trench refilling should be completed on the same day (iv) Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches			
Work Camps and worksites	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants Unsanitary and poor living conditions for workers	(i) Consult with PIU before locating project offices, sheds, and construction plants; (ii) Minimize removal of vegetation and disallow cutting of trees; (iii) Provide drinking water, water for other uses, and sanitation facilities for employees; (iv) Ensure conditions of livability at work camps are maintained at the highest standards possible at all times; Prohibit employees from poaching wildlife and cutting of trees for firewood; (v) Train employees in the storage and handling of materials which can potentially cause soil contamination; (vi) Recover used oil and lubricants and reuse or remove from the site; (vii) Manage solid waste according to the preference hierarchy: reuse, recycling and disposal to designated areas; (viii) Ensure unauthorized persons specially children are not	Construction Contractor	(i) Complaints from sensitive receptors; (ii) Drinking water and sanitation facilities for employees	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		allowed in any worksite at any given time.			
Social and Cultural Resources	Risk of archaeological chance finds	(i) Strictly follow the protocol for chance finds in any excavation work; (ii) Request PIU or any authorized person with archaeological field training to observe excavation; (iii) Stop work immediately to allow further investigation if any finds are suspected; (iv) Inform PIU if a find is suspected, and take any action they require ensuring its removal or protection in situ.	Construction Contractor	Records of chance finds	Cost for implementation of mitigation measures responsibility of contractor.
Submission of EMP implementation report	Unsatisfactory compliance to EMP	(i) Appointment of supervisor to ensure EMP implementation (ii) Timely submission of monitoring reports including pictures	Construction contractor	Availability and competency of appointed supervisor Monthly report	Cost for implementation of mitigation measures responsibility of contractor.
Post-construction clean-up	Damage due to debris, spoils, excess construction materials	(i) Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and (ii) All excavated roads shall be reinstated to original condition. (iii) All disrupted utilities restored (iv) All affected structures rehabilitated/compensated (v) The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up. (vi) All hardened surfaces within	Construction Contractor	PIU/PMDSC report in writing that (i) worksite is restored to original conditions; (ii) camp has been vacated and restored to pre-project conditions; (iii) all construction related structures not relevant to O&M are removed; and (iv) worksite clean-up is satisfactory.	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		the construction camp area shall be ripped, all imported materials removed, and the area shall be top soiled and regrassed using the guidelines set out in the revegetation specification that forms part of this document. (vii) The contractor must arrange the cancellation of all temporary services. (viii) Request PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.			

Table 8: Environmental Management Plan of Anticipated Impacts during Operation

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Construction disturbances, nuisances, public & worker safety,	All work sites	Implementation of dust control, noise control, traffic management, & safety measures. Site inspection checklist to review implementation is appended at Appendix 12	Weekly during construction	Supervising staff and safeguards specialists	No costs required
Check for blockage and leakage problems reducing the water losses	It may affect the water supply system	Effectiveness of leak detection and water auditing to reduce the water losses Implementation of Regular O&M schedules	Tonk Nagar Parishad/Operator	Tonk Nagar Parishad	NTP Cost
Check the leakages blockages, overflow problem in sewers	It may affect the sewer system, contaminate land, water and create public health issues	Effective operation to avoid and/or immediate clearance of such leaks, blockages Implementation of Regular O&M schedules	Tonk Nagar Parishad/Operator	Tonk Nagar Parishad	NTP Cost
Check the	Occupational health & safety:	(i) Provide necessary health & safety	Tonk Nagar	Tonk Nagar	NTP Cost

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
leakages blockages, overflow problem in sewers	for personnel cleaning underground sewers there is a risk due to oxygen deficiency and harmful gaseous emissions (hydrogen sulphide, carbon monoxide, methane, etc.);	training to the staff engaged sewer cleaning & maintenance (ii) provide appropriate personal protection equipment (including oxygen masks)	Parishad/Operator	Parishad	
STP operation	Improper operation due to power outage, malfunction, lakh of chemicals, may affect the treatment efficiency	(i) Ensure continuous uninterrupted power supply (ii) Provide back-up facility (such as generator) and make sure that adequate fuel supplies (iii) Provide operating manual with all standard operating procedures (SOPs) for operation and maintenance of the facility; this should include guidance on the follow up actions in case of process disruptions, inferior quality of treated water; etc. Necessary training (hands-on and class room / exposure visits) shall be provided to the ULB staff dealing with STP.	Tonk Nagar Parishad/Operator	Rajasthan Pollution Control Board	NTP Cost
STP operation	Disposal industrial effluent into sewers will upset the STP process and efficiency	(i) No industrial wastewater shall be allowed to dispose into municipal sewers (ii) No domestic wastewater from industrial units shall be allowed into municipal sewers (iii) Ensure that there is no illegal discharge through manholes or inspection chambers (iv) Conduct public awareness programs; in coordination with RPCB, issue notice to all industries for compliance (v) Conduct regular wastewater quality monitoring (at inlet and at outlet of STP) to ensure that the treated effluent quality complies with the standards	Tonk Nagar Parishad	Rajasthan Pollution Control Board	NTP Cost
Asset management	Reduction in NRW Increased efficiency of the system	Preparation of O & M Manual	Tonk Nagar Parishad	Tonk Nagar Parishad	NTP cost

Table 9: Environmental Monitoring Plan of Anticipated Impacts during Construction

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Ambient air quality	3 locations (STP site, and centre of the town, and at construction)	• PM10, PM2.5, NO2, SO2, CO	Once before start of construction Quarterly (yearly 4-times) during construction	Contractor	Cost for implementation of monitoring measures responsibility of contractor (51 samples x 4000 per sample = 204,000)
Ambient noise	3 locations (STP site, and centre of the town, and at construction)	• Day time and night time noise levels	Once before start of construction Quarterly (yearly 4-times) during construction	Contractor	Cost for implementation of monitoring measures responsibility of contractor (51 samples x 1500 per sample = 76,500)

Table 10: Environmental Monitoring Plan of Anticipated Impacts during Operation

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Monitoring of quality of water supplied to consumers	Consumer end-random sampling in all zones	pH, Nitrite, Nitrate, Turbidity BOD, Total Alkalnity, Total coliform and Feacal coliform	Monthly once	Tonk NP	TNP Cost
Monitoring of treated wastewater quality from STP	Inlet and outlet of STP	Parameters as specified by RPCB in the consent. Concentration of various parameters in treated wastewater shall be within the specific limits by RPCB, including the following: • BOD less than 30 mg/l • Suspended solids less than 100 mg/l • Faecal coliform less than 1000/100 ml	Monthly Once	Tonk NP	TNP Cost

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Sludge quality and suitability as manure	Dried sludge	Analysis for concentration of heavy metals and confirm that value are within the following limits (all units are in mg/kg dry basis except pH) • Arsenic - 10.00 • Cadmium - 5.00 • Chromium - 50.00 • Copper - 300.00 • Lead - 100.00 • Mercury - 0.15 • Nickel - 50.00 • Zinc - 1000.00 • PH - 5.5-8.5	Yearly twice	Tonk Nagar Parishad	TNP Cost
Pipeline network to sustain operational efficiency and avoid clogging and early occurrence of leakages	Pipeline network	to be included in O&M plan prepared under the project	as per O&M plan	TNP	TNP Cost
De-sludging of sludge beds to avoid sedimentation and ensure efficient collection and storage of wastewater	Sludge beds	to be included in O&M plan prepared under the project	as per O&M plan	TNP	TNP Cost

B. Institutional Requirements

130. **Government.** The Local Self Government Department (LSGD) of Government of Rajasthan will be the Executing Agency (EA) and existing RUIDP will be the Implementing Agency (IA). The LSGD will be responsible for overall strategic planning, guidance and management of the RUSDP, and for ensuring compliance with loan release conditions and loan covenants. A policy support unit will be established in the LSGD to support the government for implementation of the policy actions under the program loan. The RUIDP will be responsible for planning, implementation, monitoring and supervision, and coordination of all activities under the RUSDP. The RUIDP will recruit two consulting firms – (i) project management, design and supervision consultant (PMDSC), and (ii) community awareness and participation consultant (CAPC) to provide support in implementation of RUSDP. Six Project Implementation Units (PIUs), one each of in six project towns, shall be set up directly to assist in implementation. PMU will support PIUs in implementation, management and monitoring of the project. PMU and PIUs will be assisted by PMDSC and CAPC. PIUs will appoint construction contractors to build infrastructure. Once the infrastructure is built and commissioned, the Urban Local Bodies will operate and maintain the infrastructure.

131. Project Officer (Environment) at PMU and Assistant Safeguard Officer (ASO) at each of the PIUs will be responsible for environment management and monitoring activities, and will be supported by Environment Safeguard Specialist of PMDSC Team and Community Mobilization of Community Awareness and Participation Consultant (CAPC).

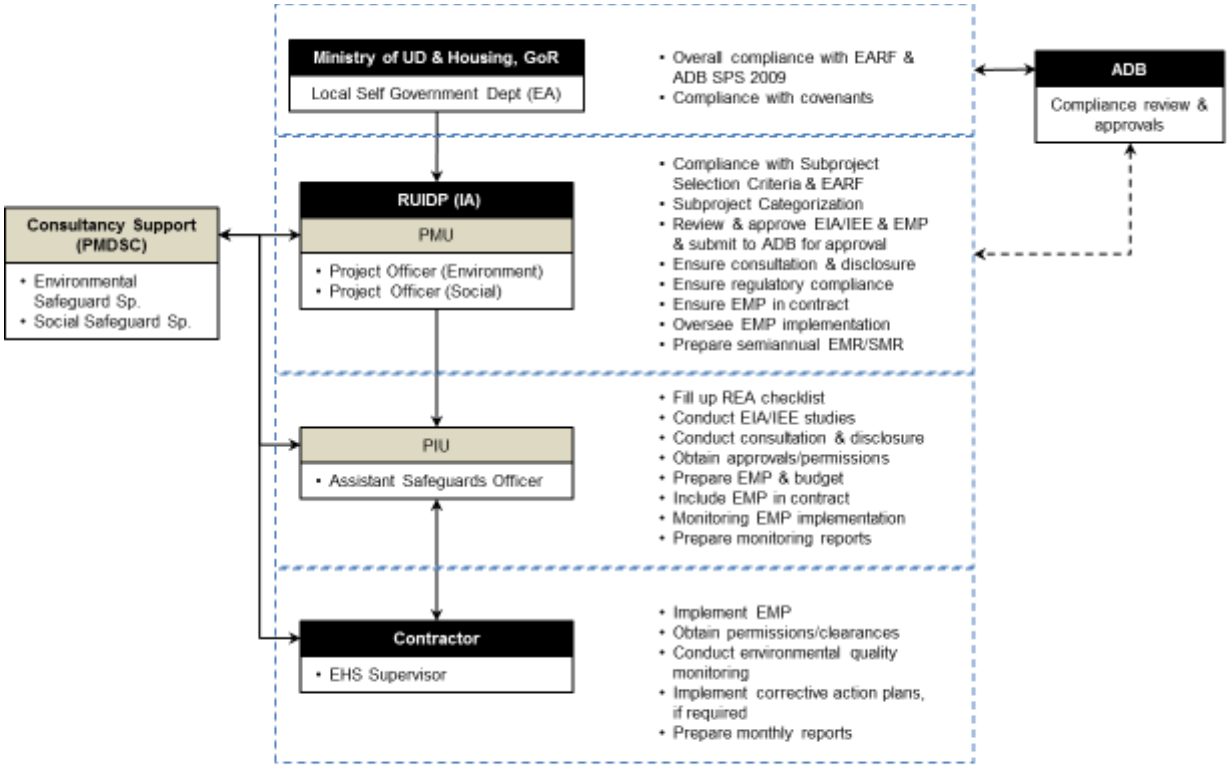
132. At state-level an inter-ministerial Empowered Committee (EC) will be established to provide overall policy direction EC will provide approval for the projects and recommend to Government for providing administrative sanction for the sub-projects. City Level Committees (CLCs) will be established in each town to oversee the implementation at town level.

133. **Consultants**. PMU and PIUs will be assisted by Project Management, Design and Supervision Consultants (PMDSC) in project planning, preparation of project and cost estimates, coordination, technical guidance and supervision, financial control, training and overall project management. Consultant Team includes an environmental safeguards specialist (ESS), who will support PO (Environment) at PMU and ASOs at PIUs in implementation, management and monitoring of all safeguard related activities. The consultant team also includes an Assistant Construction Manager at each PIU responsible for the construction supervision including environmental safeguards at subproject town level. CAPC will support PIU in construction facilitation, community consultation and grievance registration and redressal during the construction.

134. **Contractor.** The contractor shall appoint an Environment, Health and Safety (EHS) supervisor who will be responsible on a day-to-day basis for (i) ensuring implementation of EMP, (ii) coordinating with the ACM and environment safeguards specialists (all levels PO, ASO & ESS); (iii) community liaison, consultations with interested/affected parties, and grievance redressal; and (iv) reporting. Requirement of EHS Supervisor will be included in the bid documents.

135. The following figure and **Table 12** summarizes the institutional responsibility of environmental safeguards at all stages of the project.

Figure 8: Environmental Safeguards Implementation Arrangement



ADB – Asian Development Bank; EARF – Environmental Assessment and Review Procedures; EHS – Environment, Health & Safety, EIA – Environmental Impact Assessment; EMP – Environmental Management Plan; GoR – Government of Rajasthan; IA – Implementing Agency; IEE – Initial Environmental Examination; PIU – Project Implementation Unit; PMU - Project Management Unit; PMDSC – Project Management, Design & Supervision Consultant; RUIDP – Rajasthan Urban Infrastructure Development Project; REA – Rapid Environmental Assessment; SPS – Safeguard Policy Statement, 2009,

Table 11: Institutional Roles and Responsibilities

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
Project Officer (Environment), RUIDP, PMU	(i) Review REA checklists and assign categorization based on ADB SPS 2009 (ii) Review and approve EIA/IEE (iii) Submit EIA/IEE to ADB for approval and disclosure in ADB website (iv) Ensure approved IEEs are disclosed in RUIDP/PMU websites and summary posted in public areas accessible and understandable by local people. (v) Ensure environmental management plans (EMPs) are included in the bid documents and contracts (vi) Organize an orientation workshop for PMU, PIU, ULB and all staff involved in the project implementation on (a) ADB SPS, (b) Government of India national, state, and local environmental laws and regulations, (c) core	(i) Over-all environmental safeguards compliance of the project (iii) Monitor and ensure compliance of EMPs as well as any other environmental provisions and conditions. (i) Review monthly monitoring report (ii) Prepare and submit to ADB semi-annual monitoring reports (iv) If necessary prepare Corrective Action Plan and ensure implementation of corrective actions to ensure no environmental impacts; (iii) Review and submit Corrective Action Plans to ADB (iv) Organize capacity building programs on environmental safeguards	Compliance monitoring to review the environmental performance of project component, if required and as specified in EMP

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	labor standards, (d) OH&S, (e) EMP implementation especially spoil management, working in congested areas, public relations and ongoing consultations, grievance redress, etc. (vii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (viii) Organize an induction course for the training of contractors preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures; and taking immediate actions to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation. (ix) Ensure compliance with all government rules and regulations regarding site and environmental clearances as well as any other environmental requirements (x) Assist PMU, PIUs, and project NGOs to document and develop good practice construction guidelines to assist the contractors in implementing the provisions of IEE. (xi) Assist in the review of the contractors' implementation plans to ensure compliance with the IEE.	(iv) Coordinate with national and state level government agencies (vi) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (ix) Coordinate PIUs, NGOs, consultants and contractors on mitigation measures involving the community and affected persons and ensure that environmental concerns and suggestions are incorporated and implemented	
Assistant Safeguard Officer, PIU & ULB	(i) Conduct initial environmental assessment for proposed project using REA checklists and submit to PMU (ii) Prepare EIA/IEE based on categorization and submit to PMU for approval (iii) Ensure IEE is included in bid documents and contract agreements. Ensure cost of EMP implementation is provided. (iv) Disclose approved EIAs/IEEs. (v) Obtain all necessary clearances, permits, consents, NOCs, etc. Ensure compliance to the provisions and conditions. (vi) EMP implementation regarding sites for disposal of wastes, camps, storage areas, quarry sites, etc. (vii) Ensure contractors undergo EMP implementation orientation prior to start of civil works	(i) Ensure EMP implementation is included in measuring works carried out by the contractors and certifying payments. (ii) Ensure Corrective Action Plan is implemented. (ii) Conduct public awareness campaigns and participation programs (iii) Prepare monthly reports. (vi) Address any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs	(i) Conducting environmental monitoring, as specified in the EMP. (ii) Issuance of clearance for contractor's post-construction activities as specified in the EMP.

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
Consultant - PMDSC 1. Environmental Safeguard Specialist 2. Assistant Construction Manager at PIU	(i) Assist PIU in preparation of REA checklists and EIAs/IEEs (ii) Assist PIU in obtaining all necessary clearances, permits, consents, NOCs, etc. Ensure provisions and conditions are incorporated in the IEE and detailed design documents. (iii) Assist in ensuring IEE is included in bid documents and contract agreements. Assist in determining adequacy of cost for EMP implementation. (iv) Assist in addressing any concern related to IEE and EMP. (v) Assist in summarizing IEE and translating to language understood by local people.	(i) Monitor EMP implementation (ii) Recommend corrective action measures for non-compliance by contractors (iii) Assist in the review of monitoring reports submitted by contractors (iv) Assist in the preparation of monthly monitoring reports (vi) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs	(i) Assist in the inspection and verification of contractor's post-construction activities.
Contractors	(i) Ensure EMP implementation cost is included in the methodology. (ii) Undergo EMP implementation orientation prior to award of contract (iii) Provide EMP implementation orientation to all workers prior to deployment to worksites (iv) Seek approval for camp sites and sources of materials. (v) Ensure copy of IEE is available at worksites. Summary of IEE is translated to language understood by workers and posted at visible places at all times.	(i) Implement EMP. (ii) Implement corrective actions if necessary. (iii) Prepare and submit monitoring reports including pictures to PIU (iv) Comply with all applicable legislation, is conversant with the requirements of the EMP; (v) Brief his staff, employees, and laborer about the requirements of the EMP and provide environmental awareness training to staff, employees, and laborers; (vi) Ensure any sub-contractors/ suppliers who are utilized within the context of the contract comply with all requirements of the EMP. The Contractor will be held responsible for non-compliance on their behalf; (vii) Bear the costs of any damages/compensation resulting from non-adherence to the EMP or written site instructions; (viii) Ensure that PIU and ACM/ASO are timely informed of any foreseeable activities related to EMP implementation. (vi) Address any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs	(i) Ensure EMP post-construction requirements are satisfactorily complied (ii) Request certification from PIU

C. Training Needs

136. The following **Table 13** presents the outline of capacity building program to ensure EMP implementation. The estimated cost is Rs.275,000 (excluding trainings of contractors which will be part of EMP implementation cost during construction) to be covered by the project's capacity building program. The detailed cost and specific modules will be customized for the available skill set after assessing the capabilities of the target participants and the requirements of the project by the ESS of PMDSC.

Table 12: Outline Capacity Building Program on EMP Implementation

Description	Target Participants & Venue	Estimate (INR)	Cost and Source of Funds
1. Introduction and Sensitization to Environmental Issues (1 day) - ADB Safeguards Policy Statement - Government of India and Rajasthan applicable safeguard laws, regulations and policies including but not limited to core labor standards, OH&S, etc. - Incorporation of EMP into the project design and contracts - Monitoring, reporting and corrective action planning	All staff and consultants involved in the project At PMU, Jaipur	INR 100,000 (Lump sum)	PMU cost
2. EMP implementation (2 days) - Roles and responsibilities - OH&S planning and implementation - Wastes management (water, hazardous, solid, excess construction materials, spoils, etc.) - Working in congested areas, - Public relations - Consultations - Grievance redress - Monitoring and corrective action planning - Reporting and disclosure - Post-construction planning	All staff and consultants involved in the Ton subproject All contractors prior to award of contract At PIU, Tonk	INR 50,000 (Lump sum)	PMU cost
3. Plans and Protocols (1 day) - Construction site standard operating procedures (SOP)	All staff and consultants involved in the project All contractors prior to	Lump sum INR 25,000 (Lump sum) Lump sum	PMU cost Contractors cost as compliance to contract

Description	Target Participants & Venue	Estimate (INR)	Cost and Source of Funds
- AC pipe protocol - Site-specific EMP - Traffic management plan - Spoils management plan - Waste management plan - Chance find protocol - O&M plans - Post-construction plan	award of contract or during mobilization stage. At PIU Tonk	INR 25,000 (Lump sum)	provisions on EMP implementation (refer to EMP tables)
4. Experiences and best practices sharing - Experiences on EMP implementation - Issues and challenges - Best practices followed	All staff and consultants involved in the project All contractors All NGOs At PIU Jaipur	INR 100,000 (Lump sum)	PMU Cost
5. Contractors Orientation to Workers on EMP implementation (OH&S, core labor laws, spoils management, etc.)	All workers (including manual laborers) of the contractor prior to dispatch to worksite	Lump sum INR 25,000 (Lump sum)	Contractors cost as compliance to contract provisions on EMP implementation (refer to EMP tables)

Summary of Capacity Building cost for EMP Implementation

Contractor Cost	- INR 50,000
PMU Cost	- INR 275,000
Total	**- INR 325,000**

D. Monitoring and Reporting

137. Prior to commencement of the work, the contractor will submit a compliance report to PIU ensuring that all identified pre-construction environmental impact mitigation measures as detailed in the EMP will be undertaken. PIU with the assistance of the ASO and ESS of PMDSC will review the report and thereafter PMU will allow commencement of works.

138. During construction, results from internal monitoring by the contractor will be reflected in their fortnightly (twice a month) EMP implementation reports to the PIU and Assistant Construction Manager of PMDSC. ASO and ACM will review and advise contractors for corrective actions if necessary. Monthly report summarizing compliance and corrective measures taken will be prepared by ASO with the assistance of ACM and submitted to PMU.

139. Based on monthly reports and measurements, PMU will draft, review, and submit to ADB, 6-monthly (twice a year) EMP implementation progress report (**Appendix 10**). Once concurrence from the ADB is received the report will be disclosed in the Project website.

140. ADB will review project performance against the RUSDP commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system

E. EMP Implementation Cost

141. Most of the mitigation measures require the contractors to adopt good site practice, which should be part of their normal procedures already, so there are unlikely to be major costs associated with compliance. Regardless of this, any costs of mitigation by the construction contractors or consultants are included in the budgets for the civil works and do not need to be estimated separately here. Mitigation that is the responsibility of PIU/ULB will be provided as part of their management of the project, so this also does not need to be duplicated here. Cost for the capacity building program is included as part of the project.

Table 13: Cost Estimates to Implement the EMP

	Particulars	**Stages**	**Unit**	**Total Number**	**Rate (INR)**	**Cost (INR)**	**Costs Covered By**
A.	**Mitigation Measures**						
1	Compensatory plantation measures	Construction	Per tree	20	1,000	20,000	Civil works contract
	Subtotal (A)					**20,000**	
B.	**Monitoring Measures**						
	Air quality monitoring	Construction	per sample	3 x 17 = 51	4,000	204,000	Civil works contract
	Noise levels monitoring	Construction	Per sample	3 x 17 = 51	1,500	76,500	Civil works contract
	Subtotal (B)					**280,500**	
C.	**Capacity Building**						
1.	Introduction and sensitization to environment issues	Pre-construction	lump sum			100,000	PMU
2.	EMP implementation	Construction	lump sum			50,000	PMU
3.	Plans and Protocols	Construction	lump sum			25,000	PMU
			lump sum			25,000	Civil works contract
4.	Experiences and best practices sharing	Construction/Post-Construction	lump sum			100,000	PMU
5.	Contractors Orientation to Workers on EMP implementation	Prior to dispatch to worksite	Lump sum			25,000	Civil works contract
	Subtotal (C)					**325,000**	
D	**Civil Works**						
1	Construction of shelters for workers.	Construction	Lump sum			1,200,000	Civil works contract
2	Providing Water Supply Facility for the workers	Construction	Lump sum			250,000	Civil works contract
3	Providing Sanitation	Construction	Per unit	13	20,00	260,000	Civil

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
	Facility for the workers				0		works contract
5	Barricading to a height of 1.8 m (frame with MS pipes and cover with corrugated sheets)	Construction	m2	11,415	126	1,438,302	Civil works contract
6	Traffic management (Pavement Markings, Channelizing Devices, Arrow Panels and Warning Lights)	Construction	Per unit (at each location)	11	30000	330,000	Civil works contract
	Sub Total (D)					**3,478,802**	
	Total (A+B+C)				**INR**	**4,103,802**	

Contractor Cost - 3,828,802
PMU Cost - 275,000
Total - 4,103,802

VIII. CONCLUSION AND RECOMMENDATION

142. The process described in this document has assessed the environmental impacts of all elements of the Tonk water supply and sewerage subproject. All potential impacts were identified in relation to pre-construction, construction, and operation phases. Planning principles and design considerations have been reviewed and incorporated into the site planning and design process wherever possible; thus, environmental impacts as being due to the project design or location were not significant. During the construction phase, impacts mainly arise from the construction dust and noise, the need to dispose of large quantities of waste soil and import a similar amount of sand to support the sewer in the trenches; and from the disturbance of residents, businesses, traffic and important buildings by the construction work. The social impacts (access disruptions) due to construction activities are unavoidable, as the residential and commercial establishments exist along the roads where pipes/sewers will be laid. A resettlement plan has been developed in accordance with ADB SPS 2009 and Government of India laws and regulations

143. Anticipated impacts of water supply during operation and maintenance will be related to detection and repair of leaks, pipe bursts. These are, however, likely to be minimal, as proper design and selection of good quality pipe material shall mean that leaks are minimal. Leak repair work will be similar to the pipe-laying work. Similarly sewers are not 100% watertight and leaks can occur at joints. Faulty section will be exposed and repaired following the same basic procedure as when the sewer was built. Also, sewer pipes require regular maintenance as silt inevitably collects in areas of low flow over time. Necessary equipment for cleaning and removal of blockages in the sewers are included in the project. At STP, incoming sewage will be treated to meet standards and treated wastewater will be used for irrigation in the nearby fields. Anticipated impacts during operation of STP will be related to drop in treatment efficiency. This may result from - change in incoming sewage quality, power supply outage or malfunction of units. These are, however, likely to be minimal, as sewer system will receive only domestic wastewater, there will be a backup power facility, and maintenance will be as per the standard procedures.

144. At the STP sewage sludge will be removed continuously from reactors, and solidified using decanter, and stored in sludge drying beds for a period of seven days. The treatment and drying processes kill enteric bacteria and pathogens. Because of its high content of nitrates, phosphates and other plant nutrients the sludge can be used as organic fertilizer.

145. The public participation processes undertaken during project design ensured stakeholders are engaged during the preparation of the IEE. The planned information disclosure measures and process for carrying out consultation with affected people will facilitate their participation during project implementation.

146. The project's grievance redressal mechanism will provide the citizens with a platform for redressal of their grievances, and describes the informal and formal channels, time frame, and mechanisms for resolving complaints about environmental performance.

147. The EMP will assist the PMU, PIU, PMDSC and contractors in mitigating the environmental impacts, and guide them in the environmentally sound execution of the proposed project. The EMP will also ensure efficient lines of communication between PIU/ULB, PMU, consultants and contractor.

148. A copy of the EMP shall be kept on-site during the construction period at all times. The EMP shall be made binding on all contractors operating on the site, and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document shall constitute a failure in compliance.

149. The project will benefit the general public by contributing to the long-term improvement of water supply and sewerage systems and community livability in Tonk. The potential adverse environmental impacts are mainly related to the construction period, which can be minimized by the mitigating measures and environmentally sound engineering and construction practices.

150. Therefore, as per ADB SPS, the project is classified as environmental category B and does not require further environmental impact assessment. However, to conform to GoI guidelines, STP require Consent for Establishment (CFE) and Consent for Operation (CFO) from Rajasthan Pollution Control Board.

Appendix 1: REA Checklist

WATER SUPPLY

Instructions:

- This checklist is to be prepared to support the environmental classification of a project. It is to be attached to the environmental categorization form that is to be prepared and submitted to the Chief Compliance Officer of the Regional and Sustainable Development Department.
- This checklist is to be completed with the assistance of an Environment Specialist in a Regional Department.
- This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB checklists and handbooks on (i) involuntary resettlement, (ii) indigenous peoples planning, (iii) poverty reduction, (iv) participation, and (v) gender and development.
- Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: India / Rajasthan Urban Sector Development Program/ Tonk Subproject

Sector Division: Urban Development

SCREENING QUESTIONS	Yes	No	REMARKS
Water Supply			
A. Project Siting Is the project area…			
▪ Densely populated?	√		Subproject activities extend to the entire town including the densely populated areas. There are no major negative impacts envisaged, because pipeline will be located in unused government lands alongside the existing roads and can be constructed without causing disturbance to, houses, and commercial establishments. In narrow streets, disruption to road users is likely, and measure like best activity scheduling, alternative routes, prior information to road users, houses and shops will minimize the impact to acceptable levels.
▪ Heavy with development activities?	√		Tonk is a developing town; urban expansion is considerable
▪ Adjacent to or within any environmentally sensitive areas?		√	
• Cultural heritage site		√	There is a state-protected monument (Sunehri Kothi) in the town; however, no components are located in the protected area, no interference envisaged.
• Protected Area		√	
• Wetland		√	
• Mangrove		√	
• Estuarine		√	
• Buffer zone of protected area		√	
• Special area for protecting biodiversity		√	

SCREENING QUESTIONS	Yes	No	REMARKS
• Bay		√	
B. Potential Environmental Impacts Will the Project cause…			
• Pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff?		√	Not applicable. The present project does not involve any proposal for intake works.
• Impairment of historical/cultural monuments/areas and loss/damage to these sites?		√	There is a state-protected monument (Sunehri Kothi) in the town; however, no components are located in the protected area, no interference envisaged.. There are religious places of importance. However, the project will not interfere with these places
• Hazard of land subsidence caused by excessive ground water pumping?		√	Not applicable; subproject does not involve groundwater abstraction
• Social conflicts arising from displacement of communities?		√	Project does not involve land acquisition /displacement. No social conflicts envisaged
• Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		√	Not applicable. The present project does not involve any proposal for intake works
• Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?		√	The existing raw water supply will continue; no source intervention (new/ augmentation/ modification) is part of this subproject
• Delivery of unsafe water to distribution system?		√	The present project does not involve any proposal for upgrade / refurbishment of water treatment plant. The existing treatment plants will be maintained properly by the ULB to have the outlet quality meeting drinking water standards
• Inadequate protection of intake works or wells, leading to pollution of water supply?		√	Not applicable. The civil works are limited to distribution network improvement (DNI)
• Over pumping of ground water, leading to salinization and ground subsidence?		√	Not applicable; subproject does not involve groundwater abstraction
• Excessive algal growth in storage reservoir?		√	Not applicable; subproject does not involve storage reservoirs
• Increase in production of sewage beyond capabilities of community facilities?		√	Sewerage system will also be improved under RUSDP along with water supply
• Inadequate disposal of sludge from water treatment plants?		√	The present project does not involve any proposal for altering design / facilities in Water Treatment Plant. The ULB has to ensure appropriate disposal of sludge
• Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		√	.The present project does not involve any pumping and treatment plants.
• Impairments associated with transmission lines and access roads?		√	Temporary impairments are anticipated along the new transmission line routes during construction stage. No new access roads are proposed.
• Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.		√	The present project does not involve any proposal for altering design / facilities for chlorination
• Health and safety hazards to workers from the management of chlorine used for disinfection and other contaminants?		√	The present project does not involve any proposal for changes in operation of Water Treatment Plant. The ULB to follow proper safety procedures
• Dislocation or involuntary resettlement of people		√	There is no resettlement of people for project implementation.

SCREENING QUESTIONS	Yes	No	REMARKS
• Social conflicts between construction workers from other areas and community workers?		√	The contractor will be utilizing the local labour force as far as possible; in case if it is unavoidable, labour camps and facilities will be provided appropriately. No conflicts envisaged
• Noise and dust from construction activities?	√		All the construction machineries employed will comply with noise emission standards of Central Pollution Control Board. Dust suppression measures such as water sprinkling will be employed
• Increased road traffic due to interference of construction activities?	√		Excavation and laying pipelines along public roads will interfere with the traffic. Construction material transport will increase traffic within city. Proper traffic management and construction planning will be ensured to minimize the interference
• Continuing soil erosion/silt runoff from construction operations?	√		Construction work during monsoon shall be carried out with due care so that silt run off due to construction operation is prevented. No construction will be allowed during rains.
• Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?		√	The present project does not involve any proposal for altering design / facilities for chlorination facilities
• Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		√	Not envisaged
• Accidental leakage of chlorine gas?		√	The present project does not involve any proposal for altering design / facilities for chlorination facilities
• Excessive abstraction of water affecting downstream water users?		√	The existing raw water supply will continue; no source intervention (new/ augmentation/ modification) is part of this subproject
• Competing uses of water?		√	The existing raw water supply will continue; no source intervention (new/ augmentation/ modification) is part of this subproject
• Increased sewage flow due to increased water supply	√		Sewerage system will also be improved under RUSDP along with water supply
• Increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant	√		Sewerage system will also be improved under RUSDP along with water supply; this will take care of additional wastewater and appropriate sludge treatment and disposal facility will be part of this project
Sewerage	**Yes**	**No**	**Remarks**
A. Potential Environmental Impacts Will the Project cause…			
▪ impairment of historical/cultural monuments/areas and loss/damage to these sites?		√	There is a state-protected monument (Sunehri Kothi) in the town; however, no components are located in the protected area, no interference envisaged.. There are religious places of importance. However, the project will not interfere with these places

SCREENING QUESTIONS	Yes	No	REMARKS
▪ interference with other utilities and blocking of access to buildings; nuisance to neighboring areas due to noise, smell, and influx of insects, rodents, etc.?	√		Sewers will be laid underground, and will be located away from water lines maintaining the minimum distance according to standards. Construction work may interfere with the power and communication lines, but resultant impact will be minimized with co-ordination of concerned agencies in finalization of best alignment and shifting of utilities, if required. Proposed STP site is located away from inhibited areas. Adequate green buffer around the site will be provided to minimize the nuisance due to bad odour, if any.
▪ dislocation or involuntary resettlement of people	√		Project does not involve land acquisition / involuntary resettlement /displacement. During the sewer construction, particularly in narrow streets and streets with on street commercial activities, there may be temporary disruption or relocation of hawkers and vendors. These are addressed through preparation of resettlement plan.
▪ Impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?		√	Treated wastewater will be utilized for irrigation. However, the treatment process will be designed to meet the stringent inland water disposal standards set by the Central Pollution Control Board (CPCB).
▪ Overflows and flooding of neighboring properties with raw sewage?		√	Sewerage system is designed following standards. Flooding and overflowing will be avoided through regular operation and maintenance. .
▪ Environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?		√	Appropriate sludge collection, treatment, drying system is part of the STP. This sewerage system will cater only to domestic wastewater, no industrial wastewater discharge is allowed into the sewerage system.
▪ Noise and vibration due to blasting and other civil works?		√	Blasting for underground works is unlikely, mainly because of geological setting. Road cutting works for sewers is likely to generate noise. Scheduling of works appropriately and prior information to the affected people will minimize the impact.
▪ Discharge of hazardous materials into sewers, resulting in damage to sewer system and danger to workers?		√	This sewerage system will cater only to domestic wastewater, no industrial wastewater discharge is allowed into the sewerage system. As a precaution, domestic wastewater from industrial units will also not be allowed into sewers.
▪ Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances, and protect facilities?		√	There are no pumping stations, except the terminal pumping station within the STP premises. Pumping stations will be located in enclosed buildings with restricted entry. Pumps will be of low noise generating type and therefore there will be no nuisance.

SCREENING QUESTIONS	Yes	No	REMARKS
▪ Social conflicts between construction workers from other areas and community workers?		√	The contractor will be utilizing the local labour force as far as possible; in case if it is unavoidable, labour camps and facilities will be provided appropriately. No conflicts envisaged
▪ Road blocking and temporary flooding due to land excavation during the rainy season?		√	Underground construction works (sewer laying, foundations) will be carried out in non-monsoon period. In Tonk, rainfall is scanty and confined only to a limited period. No impacts envisaged
▪ Noise and dust from construction activities?	√		Road cutting (cement and bituminous roads) for sewer laying works is likely to generate noise. Scheduling of works appropriately and prior information to the affected people will minimize the impact. Dust generation will be controlled through water sprinkling, immediate transportation of excess soil, covered transport etc.
▪ traffic disturbances due to construction material transport and wastes?	√		Linear activities like sewer laying along the roads is likely to disrupt traffic. Vehicle movement for construction purpose will increase the traffic. Identification of alternate routes, allowing limited - at least one-way traffic, prior information about the works and alternative arrangements, providing information/sign boards etc. will reduce the impact.
▪ temporary silt runoff due to construction?		√	Tonk is predominantly dry and rainfall is very limited
▪ hazards to public health due to overflow flooding, and groundwater pollution due to failure of sewerage system?	√		Sewerage system will be designed with applicable standards. Adequate trained staff and necessary equipment will be in place for regular operation and maintenance of the system. Proposed treatment system will be efficient and appropriate repair and maintenance procedure will be developed. Sufficient funds for operation will be ensured. Backup power supply system is part of project.
▪ deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water?		√	Adequate sludge treatment/drying process is part of the STP No untreated/partially treated sewage will be disposed. STP designed to meet the peak demand. Regular monitoring of treated water will be conducted to check the treatment efficiency.
▪ contamination of surface and ground waters due to sludge disposal on land?		√	Sludge from reactors will be collected, and stabilized / dried before disposal. This will process will ensure the dried sludge is harmless
▪ Health and safety hazards to workers from toxic gases and hazardous materials which may be contained in sewage flow and exposure to pathogens in sewage and sludge?		√	It is unlikely that sewage contain hazardous substances. Necessary apparatus and personal protection equipment will be provided. Staff will be trained in safe handling of sewage and sludge, and in cleaning of sewers

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	Yes	No	Remarks
Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes?	√		Semi-arid zone, low and unreliable rainfall, less vegetation cover

Could changes in temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (e.g., changes in rainfall patterns disrupt reliability of water supply; sea level rise creates salinity intrusion into proposed water supply source)?		√	No
Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g.,high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?		√	No
Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., by using water from a vulnerable source that is relied upon by many user groups, or encouraging settlement in earthquake zones)?		√	No

Appendix 2: National Ambient Air Quality Standards

SL NO:	Pollutants	Time weighted average	Concentration in ambient air		Method of measurement
			Industrial, Residential, Rural & Other Areas	Ecologically Sensitive Areas	
1	Sulphur Dioxide (SO_2) $\mu g/m^3$	Annual 24 hours	50 80	20 80	Improved West and Geake-Ultraviolet fluorescence
2	Nitrogen Dioxide (NO_2) $\mu g/m^3$	Annual 24 hours	40 80	30 80	Modified Jacob & Hochheiser (Na-Arsenite) Chemiluminescence
3	Particulate Matter (Size less than 10 µm) or PM10 $\mu g/m^3$	Annual 24 hours	60 100	60 100	Gravimetric -TOEM -Beta attenuation
4	Particulate Matter (Size less than 2.5 µm) or PM2.5 $\mu g/m^3$	Annual 24 hours	40 60	40 60	Gravimetric -TOEM -Beta attenuation
5	Carbon Monoxide (CO) mg/m^3	8 hours 1 hours	02 04	02 04	Non Dispersive Infra Red (NDIR) Spectroscopy

Appendix 3: National Ambient Air Quality Standards in Respect of Noise

Area code	Category of area/zone	Limit in dB (A)	
		Day time	Night time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silence zone	50	40

Appendix 4: General Standards for Discharge of Environmental Pollutants (Wastewater)

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

Appendix 5: Vehicle Exhaust Emission Norms

1. Passenger Cars

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

2. Heavy Diesel Vehicles

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

Source: Central Pollution Control Board

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

Appendix 6: Drinking Water Standards

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

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

Appendix 7: Compliance with Environmental Criteria for Subproject Selection

Applicability	Environmental Selection Criteria	Compliance
All Subprojects	i. Comply with all requirements of relevant national and state laws.	Being complied
	ii. Avoid significant environmental impacts.	Being complied
	iii. Avoid and/or minimize involuntary resettlement by prioritizing rehabilitation over new construction, using vacant government land where possible, and taking all possible measures in design and selection of site or alignment to avoid resettlement impacts	Complied
	iv. Avoid locating subprojects in forest areas	Complied
	v. If there are underground asbestos cement (AC) pipes in the existing systems, the project design should include that the AC pipes are left undisturbed in the ground vi. Prior to site clearance & trench exaction for pipes/sewers, exact location of underground AC pipes should be ascertain with the Public Health Engineering Department (PHED)	Being complied
	vii. Avoid where possible, and minimize to extent feasible, facilities in locations with social conflicts.	Complied
	viii. Avoid where possible locations that will result in destruction/disturbance to historical and cultural places/values.	Being complied
	ix. Avoid tree-cutting where possible. Retain mature roadside trees which are important/valuable or historically significant. If any trees have to be removed, plant two new trees for every one that is lost.	Being complied
	x. Ensure all planning and design interventions and decisions are made in consultation with local communities and include women. Reflect inputs from public consultation and disclosure for site selection.	Being complied
Water Supply	i. Comply with all requirements of relevant national and local laws, rules, and guidelines.	Being complied
	ii. Utilize water sources at sustainable levels of abstraction only (i.e. without significant reductions in the quantity or quality of the source overall); augmentation of water supply from an existing groundwater source or development of new groundwater source should be supported by groundwater studies establishing water availability and sustainability	Not applicable
	iii. Avoid using water sources that may be polluted by upstream users;	Not applicable
	iv. Avoid water-use conflicts by not abstracting water that is used for other purposes (e.g., irrigation);	Not applicable
	v. Locate all new facilities/buildings at sites where there is no risk of flooding or other hazards that might impair functioning of, or present a risk of damage to water treatment plants, tanks/reservoirs, or their environs.	Complied
	vi. Locate pipelines within road right of way (RoW) as far as possible, to reduce the acquisition of new land. Ensure that pipeline routes do not require the acquisition of land from private owners in amounts that are a significant proportion of their total land holding (>10%).	Complied
	vii. Ensure that communities who relinquish land needed for pipelines or other facilities are provided with an improved water supply as part of the scheme.	Not applicable
	viii. Avoid all usage of pipes that are manufactured from asbestos concrete.	Complied
	ix. Ensure water to be supplied to consumers will meet national drinking water standards at all times.	Being complied
	x. Ensure that improvements in the water supply system are combined with improvements in wastewater and drainage to deal with the increased discharge of domestic wastewater.	Being complied
	xi. Ensure appropriate training will be provided to ULB staff on the	Being complied

Applicability	Environmental Selection Criteria	Compliance
	operations and maintenance of the facilities.	
	xii. Ensure sludge management facilities are included in the water treatment plant.	Not applicable
Sewerage	i. Comply with all requirements of relevant national and local laws, rules, and guidelines.	Being complied
	ii. Ensure no immediate downstream drinking water intakes at treated wastewater disposal point.	Being complied
	iii. Locate sewage treatment plant (STP) preferably 500 m from any inhabited areas, in locations where no urban expansion is expected in the next 20 years, so that people are not affected by odor or other nuisance from the STP.	Complied
	iv. Locate facilities where there is a suitable means of disposal for the treated wastewater effluent and bio-solids.	Complied
	v. Locate facilities where there is no risk of flooding or other hazards that might impair operations and present a risk of damage to the facilities or its environs.	Complied
	vi. Ensure appropriate training will be provided to ULB staffs on the operations and maintenance of the facilities.	Being complied
	vii. Locate sewage pipelines on roads RoW wherever feasible, to reduce the acquisition of new land	Complied

Appendix 8: Salient Features of Major Labor Laws Applicable to Establishments Engaged in Construction of Civil Works

(i) Workmen Compensation Act, 1923 - The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

(ii) Payment of Gratuity Act, 1972 - Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years' service or more or on death at the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

(iii) Employees' PF and Miscellaneous Provisions Act, 1952 - The Act provides for monthly contributions by the employer plus workers @10 % or 8.33 %. The benefits payable under the Act are: (a) Pension or family pension on retirement or death as the case may be; (b) deposit linked insurance on the death in harness of the worker; (c) payment of PF accumulation on retirement/death etc.

(iv) Maternity Benefit Act, 1951 - The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

(v) Contract Labour (Regulation and Abolition) Act, 1970 - The Act provides for certain welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law. The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor.

(vi) Minimum Wages Act, 1948 - The employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employment.

(vii) Payment of Wages Act, 1936 - It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

(viii) Equal Remuneration Act, 1979 - The Act provides for payment of equal wages for work of equal nature to Male and Female workers and not for making discrimination against Female employees in the matters of transfers, training and promotions etc.

(ix) Payment of Bonus Act, 1965 - The Act is applicable to all establishments employing 20 or more workmen. The Act provides for payments of annual bonus subject to a minimum of 8.33 % of wages and maximum of 20 % of wages to employees drawing Rs. 3,500/- per month or less. The bonus to be paid to employees getting Rs. 2,500/- per month or above up to Rs.3,500/- per month shall be worked out by taking wages as Rs.2,500/- per month only. The Act does not apply to certain establishments. The newly set up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of the Act.

(x) Industrial Disputes Act, 1947 - The Act lays down the machinery and procedure for resolution of industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

(xi) Industrial Employment (Standing Orders) Act, 1946 - It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the employer on matters provided in the Act and get the same certified by the designated Authority.

(xii) Trade Unions Act, 1926 - The Act lays down the procedure for registration of trade unions of workmen and employees. The trade unions registered under the Act have been given certain immunities from civil and criminal liabilities.

(xiii) Child Labor (Prohibition and Regulation) Act, 1986 - The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of child labor is prohibited in Building and Construction Industry.

(xiv) Inter-State Migrant Workmen's (Regulation of Employment and Conditions of Service) Act, 1979 - The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc.

(xv) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996 - All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay Cess at rate not exceeding 2% of the cost of construction as may be notified by the Government. The employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc. The employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

Appendix 9: Sample Outline Spoil Management Plan

- The Spoil Management Plan should be site specific and be part of the monthly Construction Management Plan.
- The contractor, in consultation with the ULB, has to find out appropriate location/s for the disposal of the excess soil generated. The spoils should be deposited only at these sites.
- Further precautions need to be taken in case of the contaminated spoils.
- The vehicle carrying the spoil should be covered properly.
- The spoils generating from each site should be removed on the same day or immediately after the work is complete. The site / road should be restored to the original condition.

I. Spoils information

The spoil information contains the details like a) The type / material, b) Potential contamination by that type, c) Expected volume (site / component specific), d) Spoil Classification etc.

II. Spoils management

The Spoil Management section gives the details of a) Transportation of spoil b) disposal site details c) Precautions taken d) Volume of contaminated spoil, if present, d) Suggested reuse of disposal of the spoil

III. Documentation

The volume of spoil generated (site specific, date wise), site disposed, reuse / disposal details should be documented properly.

Appendix 10: Sample Outline Traffic Management Plan

A. Principles for TMP around the Water Pipes/Sewer Construction Sites

1. One of the prime objectives of this TMP is to ensure the safety of all the road users along the work zone, and to address the following issues:

(i) the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
(ii) protection of work crews from hazards associated with moving traffic;
(iii) mitigation of the adverse impact on road capacity and delays to the road users;
(iv) maintenance of access to adjoining properties; and
(v) addressing issues that may delay the project.

B. Operating Policies for TMP

2. The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

(i) Make traffic safety and temporary traffic control an integral and high-priority element of project from planning through design, construction, and maintenance.
(ii) Inhibit traffic movement as little as possible.
(iii) Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
(iv) Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
(v) Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
(vi) Train all persons that select, place, and maintain temporary traffic control devices.
(vii) Keep the public well informed.
(viii) Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

3. **Figure A2 to Figure A12** illustrates the operating policy for TMP for the construction of water pipes and the sewers along various types of roads.

C. Analyze the impact due to street closure

4. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

(i) approval from the ULB/ Public Works Department (PWD) to use the local streets as detours;
(ii) consultation with businesses, community members, traffic police, PWD, etc., regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
(iii) determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
(iv) determining if additional traffic control or temporary improvements are needed along the detour route;

(v) considering how access will be provided to the worksite;
(vi) contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
(vii) developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

5. If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the detour street or public opposition, the full closure can be restricted to weekends with the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

Figure A1: Policy Steps for the TMP

D. Public awareness and notifications

6. As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

6. The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the

time when the roadblocks or traffic diversions take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices, ward level meetings and city level meeting with the elected representatives.

7. The PIU will also conduct an awareness campaign to educate the public about the following issues:

(i) traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
(ii) defensive driving behaviour along the work zones; and
(iii) reduced speeds enforced at the work zones and traffic diversions.

8. It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

9. The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centres. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

(i) explain why the brochure was prepared, along with a brief description of the project;
(ii) advise the public to expect the unexpected;
(iii) educate the public about the various traffic control devices and safety measures adopted at the work zones;
(iv) educate the public about the safe road user behaviour to emulate at the work zones;
(v) tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
(vi) indicate the office hours of relevant offices.

E. Install traffic control devices at the work zones and traffic diversion routes

10. The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

11. Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume,

and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary “STOP” and “GO”).

12**.** **Figure A2 to Figure A12** illustrates a typical set-up for installing traffic control devices at the work zone of the area, depending on the location of work on the road way, and road geometrics:

- Work on shoulder or parking lane
- Shoulder or parking lane closed on divided road
- Work in Travel lane
- Lane closure on road with low volume
- Lane closure on a two-line road with low volume (with yield sign)
- Lane closure on a two-line road with low volume (one flagger operation)
- Lane closure on a two lane road (two flagger operation)
- Lane closure on a four lane undivided Road
- Lane closure on divided roadway
- Half road closure on multi-lane roadway
- Street closure with detour

13. The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

14. Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flagggers/ personnel should be equipped with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

16. In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

Figure A2 & A3: Work on shoulder or parking lane & Shoulder or parking lane closed on divided road

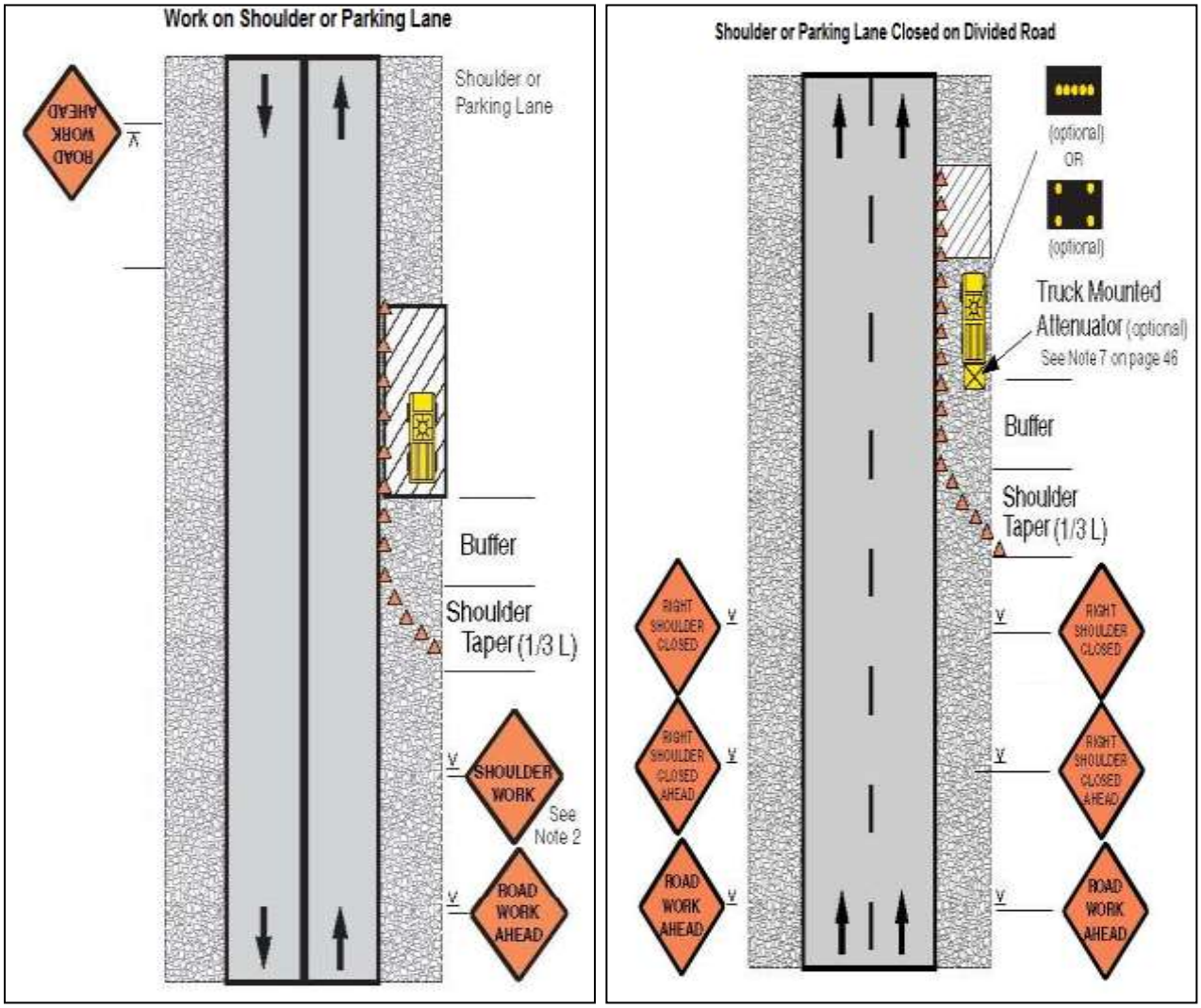


Figure A4 & A5: Work in Travel lane & Lane closure on road with low volume

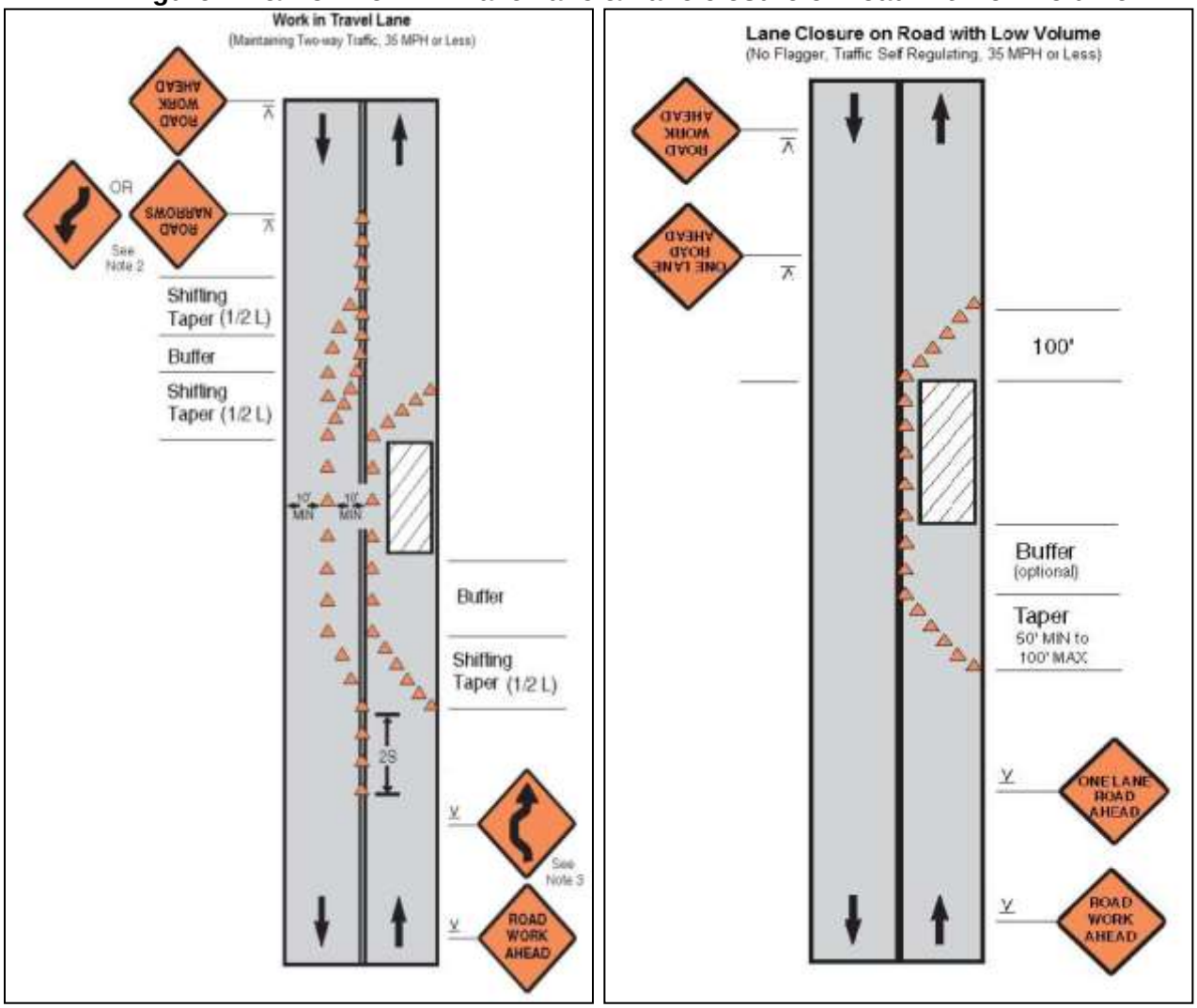
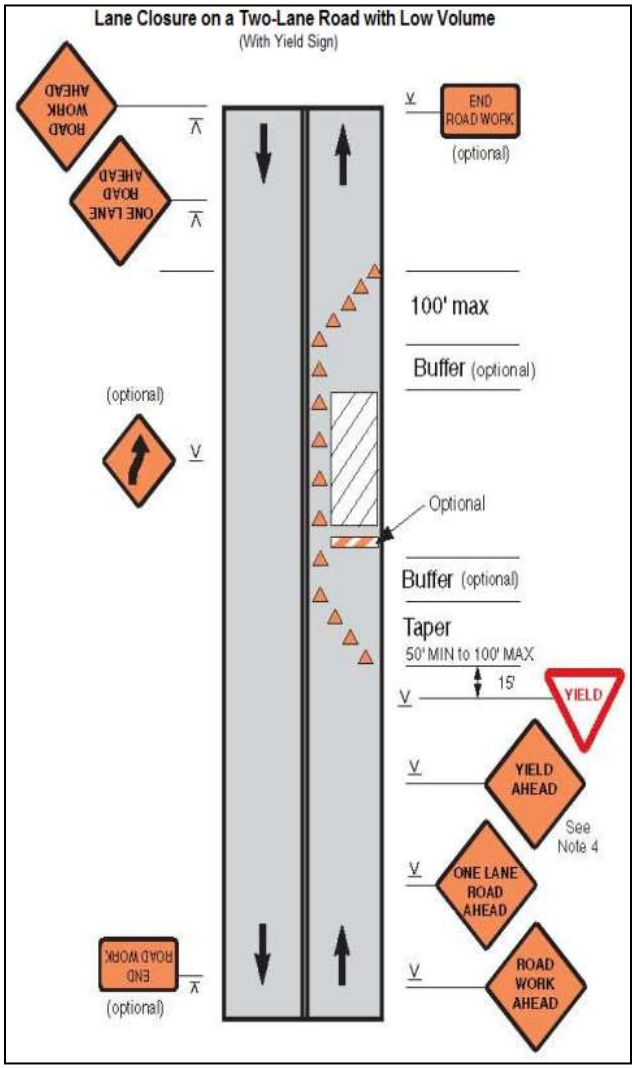


Figure A6 & A7: Lane closure on a two-line road with low volume (with yield sign) & Lane closure on a two-line road with low volume (one flagger operation)



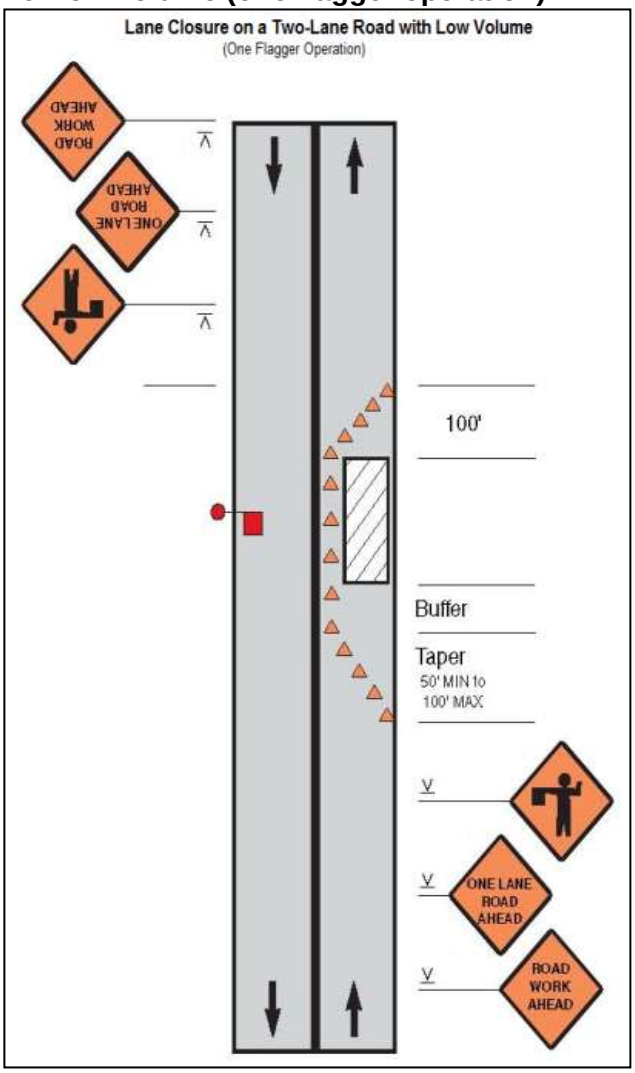


Figure A8 & A9: Lane Closure on a Two-Lane Road (Two Flagger Operation) & Lane Closure on a Four-Lane Undivided Road

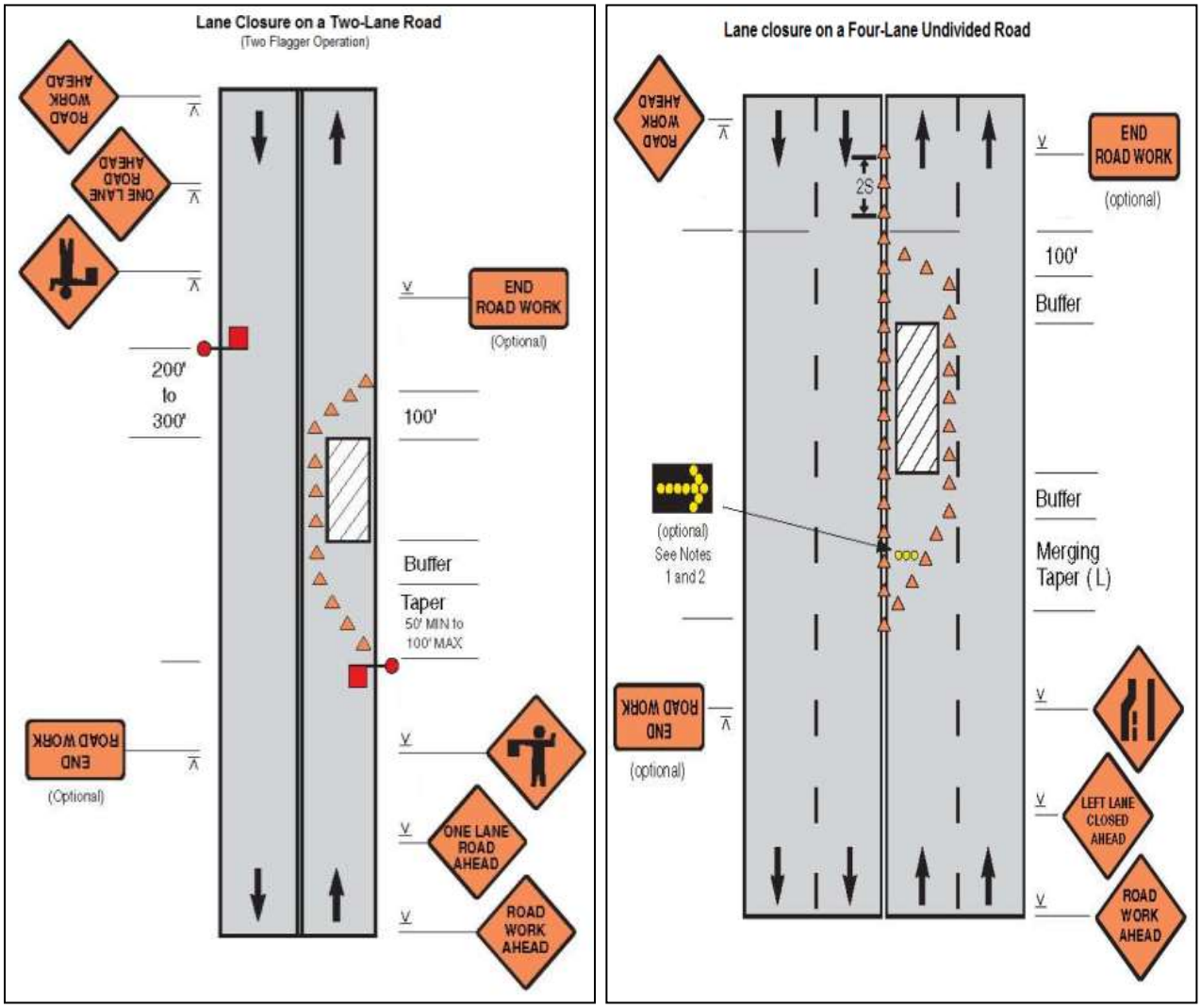


Figure A10 & A11: Lane Closure On Divided Roadway & Half Road Closure On Multi-Lane Roadway

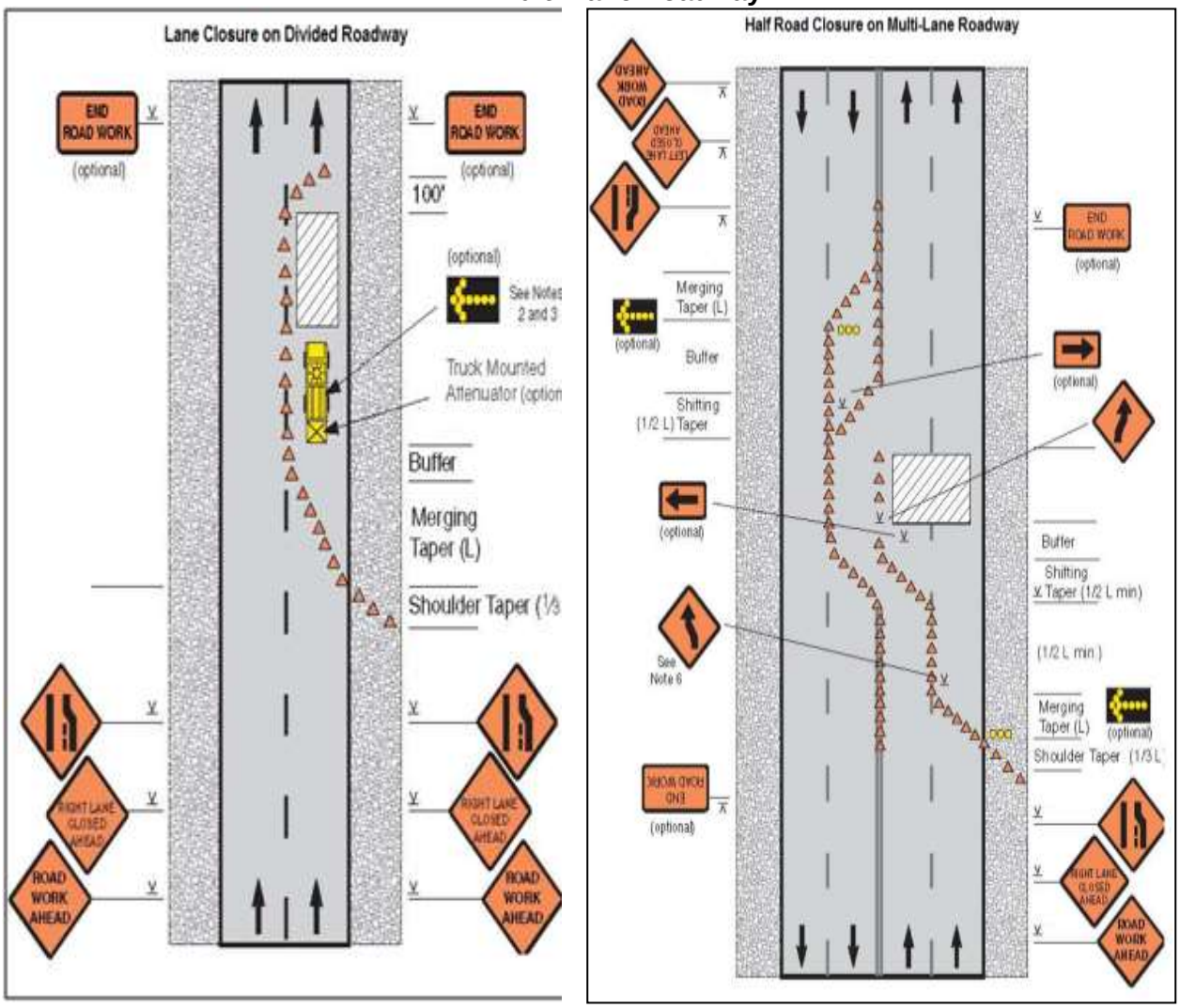
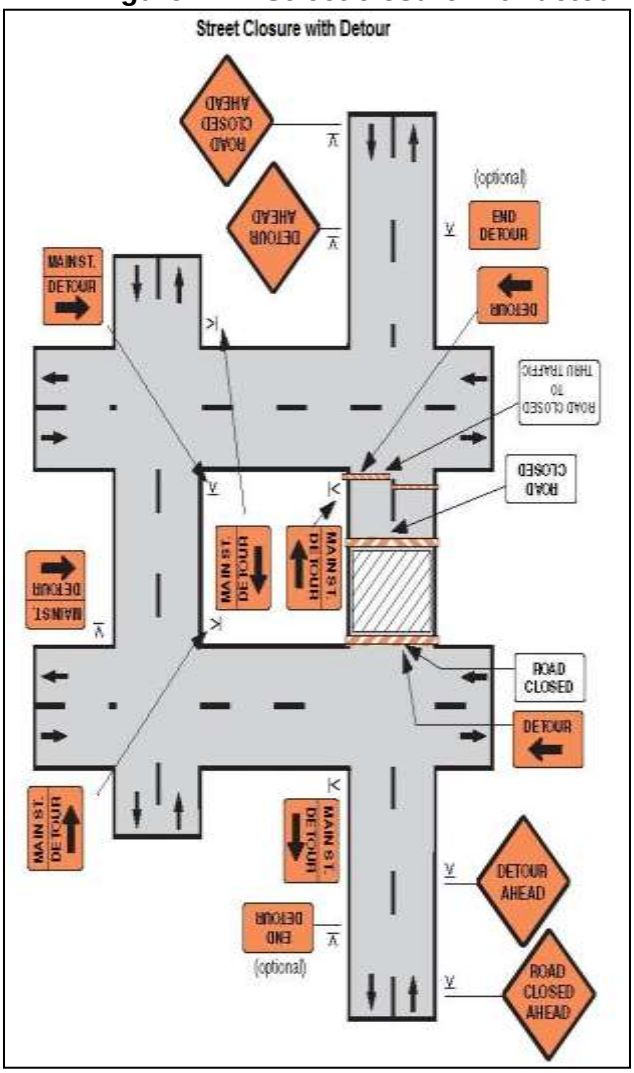


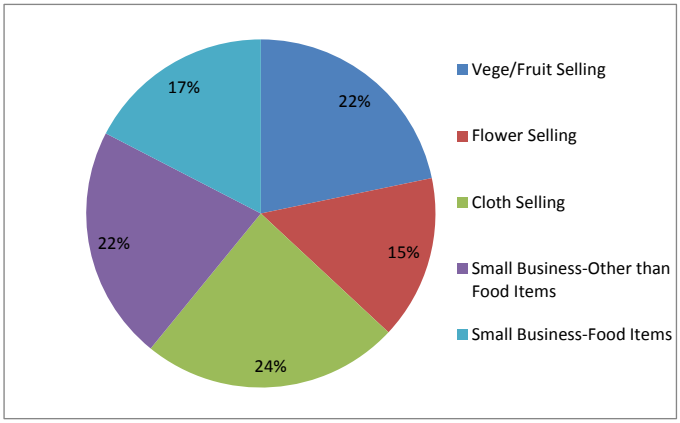
Figure A12: Street closure with detour

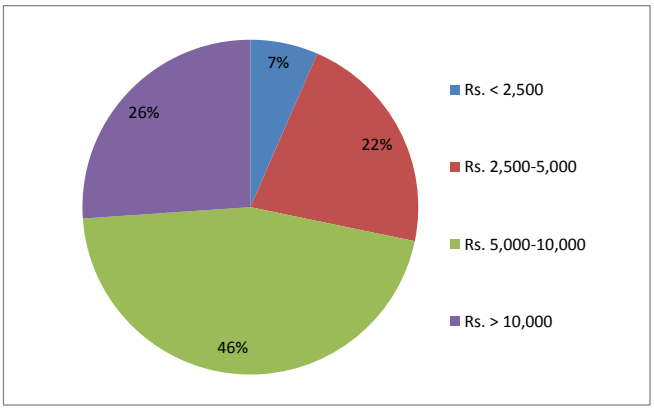


Appendix 11: Public Consultations Conducted During Project Preparation

A. Socio-economic Surveys conducted in June-August 2103

1. Transect walks identified a total of 46 APs whose business will be temporarily affected during pipe laying, as they carry their activities with in RoW. These businesses can be broadly classified into five main categories as: (i) vegetable/fruit selling; (ii) Flower selling; (iii) cloth selling; (iv) small business other than food items such as bangles, mats, locks, cosmetic items etc. selling; and (v) small businesses related to food items such as juice, tea, pan and fast food selling. Some of the surveyed APs (especially those who sell vegetable/fruits) indicated that they sometimes take rounds in confined areas to sell their products home-to-home though their place of standing is stationary/fixed otherwise. Almost all of them (90 percent) have movable structures. The remaining APs either have constructed temporary sheds (can easily dismantled) or sit on roads for selling their goods. An average cost of their business unit/structure was estimated at Rs. 15,076 with minimum at Rs. 1,500 and maximum at Rs. 70,000.

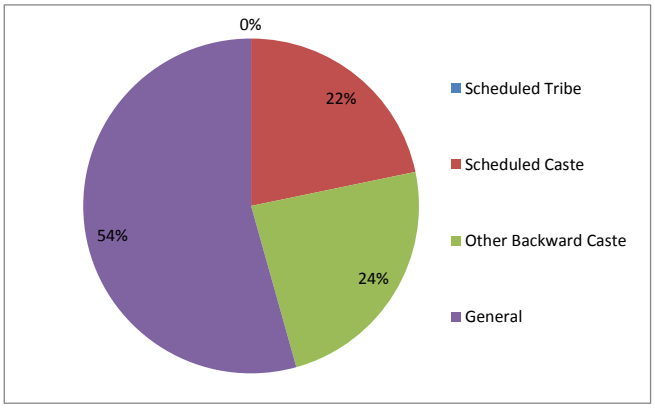




2. Street vending is quite a common practice in Tonk and around 42 percent of the APs indicated that they are doing their business at present location for more than 10 years. An additional 28 percent indicated that they have this fixed location for more than five years while the remaining 30 percent said they have moved in respective places in last 1-5 years.

3. In terms of the socio-economic background, around seven percent of the APs indicated that they earn income below poverty line (BPL) (Rs. less than 2,500 per month). Close to 46 percent earn monthly income between Rs. 5,000-10,000 and belong to lower middle class group. Average monthly income works out at Rs. 8,489 with minimum at Rs. 1,000 and maximum at Rs. 30,000. Considering work week of six days (26 days per month), average daily income is estimated at Rs. 327 for APs. This is certainly higher than daily minimum wages prescribed for the region for skilled labour at Rs.166.

4. More than 50 percent of the APs belong to general (upper) caste category while the remaining are scheduled caste (SCs-22%), and other backward classes (OBC-24%). None of the APs belong to scheduled tribe (ST) category. Also, though there are women APs, there were no women headed households (WHH)[10] found during the survey. Total vulnerable[11] APs comprise 28 percent of the total surveyed APs. Average family size for surveyed APs was 7.1. All the surveyed APs were residents of Tonk living in the city for more than 5 years.



5. Transect walk data/analysis will be updated road wise where pipelines will be laid before mobilization of contractor and revised RP will be submitted to the ADB for approval[12.] A 100 percent census and socio-economic surveys will be undertaken to register and document the status of affected people (APs) within subproject impact area[13.]

B. Proceedings of City Level Stakeholder Consultation Meeting At Tonk on April, 30, 2014

1. This stakeholder consultation meeting was organised on April 30, 2014 at Tonk District collector's meeting hall. The meeting was organised by the Tonk Nagar Parishad (TNP) with the support of RUIDP PMU and ADB PPTA Team. District Collector Tonk chaired the meeting. Representatives of Tonk Nagar Parishad (elected and technical/administrative) participated in the meeting. In all 12 persons, representing various agencies, attended the meeting.

2. The objective of the meeting was to appraise the stakeholders about the proposed Rajasthan urban Infrastructure Development Project III (RUIDP III). The subprojects proposed for Tonk in water supply and sewerage sector, and the likely environmental and social issues, and the proposed mitigation measures were discussed during the meeting.

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[10] Household is considered women headed when she is the single bread earner of the family or earn most of the income for the family.

[11] Vulnerable households may include female-headed household, physically handicapped-headed household, scheduled tribe-headed households, Below Poverty Line households, and households with marginal land holdings, that is the only source of livelihood, and majority of that land is being acquired under the project.

[12] It is suggested under this RUSDP that separate RPs needs to be prepared for each subproject (separate for water supply and sewerage, and not city wise) and list of temporary APs should be separated from any APs which envisage permanent impacts. RPs should also include separate and clear sections on their socio-economic profile, impacts and entitlements.

[13] During RP revision, census/socio-economic surveys for temporary impacts should include specific questions on place of business, its seasonal variation and AP's migrant nature. A separate list of such APs should be made to suggest that they may not be present at the same location during construction time/compensation. These APs however will be still entitled for compensation (if affected due to project). However, such list will tentatively indicate PMU/PIU/ADB the extent of missing APs during implementation. It is also suggested under this RUSDP that missing APs under temporary impacts not traceable for more than 18 months after the start of compensation disbursement, or do not claim their entitlement within project construction period, will bear no impacts of the project and hence will not be considered for compensation.

3. A detailed presentation on overall RUIDP III, and subprojects and components proposed in Tonk was made to the stakeholders. Executive summary of Initial Environmental Examination (IEE) conducted for the Tonk subproject, Environmental Management Plan, proposed Grievance Redress Mechanism (GRM), draft Entitlement Matrix of the Resettlement Framework was displayed at the meeting, and were made available to the interested persons.

4. The comments, suggestions of the stakeholders are presented below:

- All the stakeholders were supportive of the project and indicated their willingness to participate in the project to make it successful.
- Stakeholders were of the view that these subprojects provide benefits to all the people by improving water supply and sewerage.
- Stakeholders are concerned about the pollution of water bodies due to entry of wastewater. It was explained that this subproject will mitigate this problem by effectively collecting, treating the sewage.
- Stakeholders requested provision of water supply and sewerage infrastructure in outer areas of the city
- Stakeholders suggested that (i) utility shifting should be properly planned before execution of the work; (ii) road restoration should be carried out properly; (iii) in major roads where width of the road is more, water supply lines to be laid in duct for easy maintenance in the future; and (iv) complete existing distribution network has to replaced

Appendix 12: Sample Monthly Reporting Format for Assistant Safeguards Officer/Assistant Construction Manager

1. Introduction

- Overall project description and objectives
- Description of sub-projects
- Environmental category of the sub-projects
- Details of site personnel and/or consultants responsible for environmental monitoring
- Overall project and sub-project progress and status

No.	Sub-Project Name	Status of Sub-Project				List of Works	Progress of Works
		Design	Pre-Construction	Construction	Operational Phase		
		☐	☐	☐	☐		
		☐	☐	☐	☐		
		☐	☐	☐	☐		

2. Compliance status with National/ State/ Local statutory environmental requirements

No.	Sub-Project Name	Statutory Environmental Requirements	Status of Compliance	Action Required

3. Compliance status with environmental loan covenants

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

4. Compliance status with the environmental management and monitoring plan

- Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.
- There should be reporting on the following items which can be incorporated in the checklist of routine Environmental Site Inspection Report followed with a summary in the semi-annual report send to ADB. Visual assessment and review of relevant site documentation during routine site inspection needs to note and record the following:
    - What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries;
    - If muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads;
    - adequacy of type of erosion and sediment control measures installed on site, condition of erosion and sediment control measures including if these were intact following heavy rain;

- Are their designated areas for concrete works, and refuelling;
- Are their spill kits on site and if there are site procedure for handling emergencies;
- Is there any chemical stored on site and what is the storage condition?
- Is there any dewatering activities if yes, where is the water being discharged;
- How are the stockpiles being managed;
- How is solid and liquid waste being handled on site;
- Review of the complaint management system;
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Summary Monitoring Table

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

Overall Compliance with CEMP/ EMP

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

5. Approach and methodology for environmental monitoring of the project

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

6. Monitoring of environmental impacts on project surroundings (ambient air, water quality and noise levels)

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

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

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 $\mu g/m^3$	SO_2 $\mu g/m^3$	NO_2 $\mu g/m^3$

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 $\mu g/m^3$	SO_2 $\mu g/m^3$	NO_2 $\mu g/m^3$

Water Quality Results

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

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

Noise Quality Results

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

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

7. Summary of key issues and remedial actions

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

8. Appendixes

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

APPENDIX 13: SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name
Contract Number

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

WEATHER:

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Monitoring Items	Compliance
Compliance marked as Yes / No / Not applicable (NA) / Partially Implemented (PI)	
EHS supervisor appointed by contractor and available on site	
Construction site management plan (spoils, safety, schedule, equipment etc.,) prepared	
Traffic management plan prepared	
Dust is under control	
Excavated soil properly placed within minimum space	
Construction area is confined; no traffic/pedestrian entry observed	
Surplus soil/debris/waste is disposed without delay	
Construction material (sand/gravel/aggregate) brought to site as & when required only	
Tarpaulins used to cover sand & other loose material when transported by vehicles	
After unloading , wheels & undercarriage of vehicles cleaned prior to leaving the site	
No AC pipes disturbed/removed during excavation	
No chance finds encountered during excavation	
Work is planned in consultation with traffic police	
Work is not being conducted during heavy traffic	
Work at a stretch is completed within a day (excavation, pipe laying & backfilling)	
Pipe trenches are not kept open unduly	
Road is not completely closed; work is conducted on edge; at least one line is kept open	
Road is closed; alternative route provided & public informed, information board provided	
Pedestrian access to houses is not blocked due to pipe laying	
Spaces left in between trenches for access	
Wooden planks/metal sheets provided across trench for pedestrian	
No public/unauthorized entry observed in work site	
Children safety measures (barricades, security) in place at works in residential areas	
Prior public information provided about the work, schedule and disturbances	
Caution/warning board provided on site	
Guards with red flag provided during work at busy roads	
Workers using appropriate PPE (boots, gloves, helmets, ear muffs etc)	
Workers conducting or near heavy noise work is provided with ear muffs	
Contractor is following standard & safe construction practices	
Deep excavation is conducted with land slip/protection measures	
First aid facilities are available on site and workers informed	

Monitoring Items	Compliance
Drinking water provided at the site	
Toilet facility provided at the site	
Separate toilet facility is provided for women workers	
Workers camps are maintained cleanly	
Adequate toilet & bath facilities provided	
Contractor employed local workers as far as possible	
Workers camp set up with the permission of PIU	
Adequate housing provided	
Sufficient water provided for drinking/washing/bath	
No noisy work is conducted in the nights	
Local people informed of noisy work	
No blasting activity conducted	
Pneumatic drills or other equipment creating vibration is not used near old/risky buildings	

Signature

_____

Sign off

_____ _____

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

Appendix 14: Sample Grievance Registration Form

(To be available in Hindi and English)

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

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

FOR OFFICIAL USE ONLY

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