Initial Environmental Examination

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Project Number: 43253-025
December 2016

IND: Karnataka Integrated Urban Water Management Investment Program – Tranche 1 (Byadgi Town Sewerage Subproject)

Package Number: 01BDG01

Prepared by the Karnataka Urban Infrastructure Development and Finance Corporation, Government of Karnataka for the Asian Development Bank.

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CURRENCY EQUIVALENTS

(as of 22nd November 2016)

Currency unit	–	Equivalent to
Rs1.00	=	$ 0.015
$1.00	=	Rs68.26

ABBREVIATIONS

AC	Asbestos Cement
ADB	Asian Development Bank
APMC	Agricultural Produce Market Committee
ASI	Archaeological Survey of India
BOD	Bio-Chemical Oxygen Demand
CBO	Community Based Organizations
CSS	Construction Supervision Specialist
CFE	Consent for Establishment
CFO	Consent for Operation
CGWB	Central Ground Water Board
CMC	City Municipal Council
C	City Corporation
CPHEEO	Central Public Health and Environmental Engineering Organization
CPCB	Central Pollution Control Board
CRO	Complaint Receiving Officer
dB	Decibels
DC	Design Consultant
DI	Ductile Iron
DPD	Deputy Project Director
DPR	Detailed Project Report
E	East
EA	Executing Agency
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ERP	Emergency Response Plan
GoI	Government of India
GoK	Government of Karnataka
GO	Government Order
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HDPE	High Density Poly Ethylene
HSC	House Service Connection
H&S	Health and Safety
IA	Implementing Agency
IEE	Initial Environmental Examination
IFC	International Finance Corporation
INRM	Indian Residential Mission
IWRM	Integrated Water Resource Management
KIADB	Karnataka Industrial Area Development Board

KIUWMIP	Karnataka Integrated Urban Water Management Investment Program
KSPCB	Karnataka State Pollution Control Board
KUIDFC	Karnataka Urban Infrastructure Development & Finance Corporation
MFF	Multitranche Financing Facility
MoEF	Ministry of Environment and Forest
MS	Mild Steel
MSL	Mean Sea Level
N	North
NGO	Non-Government Organisation
NOx	Nitrogen Oxide
OH & S	Occupation Health and Safety
O&M	Operations & Maintenance
PIU	Program Implementation Unit
PMDCSC	Project Management Design and Construction Supervision Consultant
PMU	Program Management Unit
PPE	Personal Protection Equipment
PUC	Pollution Under Control
PWD	Public Works Department
R&R	Resettlement and Rehabilitation
RCC	Reinforced Cement Concrete
RE	Resident Engineer
REA	Rapid Environmental Assessment
RoW	Right of Way
RP	Resettlement Plan
RPMU	Regional Programme Management Unit
RSPM	Respirable Suspended Particulate Matter
SBR	Sequencing Batch Reactors
SC	Steering Committee
SEIAA	State Environmental Impact Assessment Authority
SOP	Standard Operating Procedures
SPM	Suspended Particulate Matter
SPS	Safeguard Policy Statement
STP	Sewage Treatment plant
TMC	Town Municipal Council
ToR	Terms of Reference
ULB	Urban Local Body
USD	US Dollars
UWSS	Urban Water Supply & Sanitation
WWTP	Waste Water Treatment Plant

WEIGHTS AND MEASURES

^{o}C	degree centigrade
dia	diameter
kg	kilo gram
Kl	kilolitre
km	kilometre
kmph	kilometre per hour
ha	hectares
ham	hectares meters
l/hd/d	liters per head per day
lpcd	liters per capita per day
lps	liters per second
m	meter
m^3	Cubic meter
mg	milli gram
mm	milli meter
m^2/day	meter square per day
M	million
mbgl	meters below ground level
mcm	million cubic meters
mg/l	milligram per liter
MLD	million liters per day
m	meter
mm	millimetre

NOTE{S}

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

TABLE OF CONTENTS

Page

LIST OF TABLE

LIST OF FIGURES

Table of Contents

EXECUTIVE SUMMARY

1. The Karnataka Integrated Urban Water Management Investment Program (KIUWMIP) aims to improve water resource management in urban areas in a holistic and sustainable manner. Investment support will be provided to modernize and expand Urban Water Supply and Sanitation (UWSS) while strengthening relevant institutions to enhance efficiency, productivity and sustainability in water use.

2. **Implementation Arrangements.** Karnataka Urban Infrastructure Development & Finance Corporation (KUIDFC) is the Executing Agency (EA) responsible for implementing the Investment Program. Investment Program implementation activities is monitored by KUIDFC through a separate Investment Program Management Unit (PMU) for the IWRM Project, which set-up within KUIDFC. At the Executing Agency (i.e. KUIDFC), environmental issues coordinated centrally by an Environmental Specialist (Designated as Assistant Executive Engineer–Environment),reportingtotheTask Manager, Assistant Executive Engineer–Environment will ensure that all subprojects comply with environmental safeguards.TheIEE/ EIA reports prepared by the Consultant, andwill be reviewed by the Assistant Executive Engineer–Environment as per the ADB's Environmental Guidelines and forwarded to ADB for review and approval. The consultant (Program Management design construction supervision consultant, PMDCSC) includes an environmental specialist to supervise the implementation of environmental safeguards. The consultant team also includes a Construction Supervisor at each ULB/CMC responsible for the supervision of project implementationincluding environmental safeguards at the ULB/CMC level. Like other town/city, in Byadgi Program Implementation Unit (PIU) there is one Assistant Executive Engineer (AEE) responsible for safeguard implementation and environment specialist of PMDCSC assist AEE for environmental compliance. The contractor shall appoint one supervisor (environment & safety officer) who will be responsible on a day-to day basis for ensuring implementation of EMP, coordinating with RE and environment specialists(all levels), community liaison, consultation with interested/affected parties and grievance redressal and necessary reporting.

3. ByadgiTown Sewerage Subproject (Package No. 01BDGO1) is one of the subprojects proposed in Tranche 1.

4. The projected wastewater flows generated in Byadgi are 5Million Litres per Day (MLD) and 6.70 MLD for the years 2031 and 2046 respectively. At present there is no underground waste water collection system and treatment. Waste water from most of the properties flow in to the storm water drains and ultimately reaches the stream which is flowing on the north of the town. The stream flows east to north-east and joins a relatively large lake about 8 to 9 km on the downstream, near HomaradiVillage.There is no sewage treatmentplant(STP) available in Byadgi at present.

5. **Subproject Scope**. Byadgi Town Sewerage Subproject (Package No. 01BDGO1)will address gaps in sewerage and sanitation infrastructure to meet the design demand. The Sewerage generation estimated for the intermediate design year (2031) is 5.00 MLD and for the ultimate design year (2046) is 6.70 MLD. Subproject includes the following infrastructure(i) new sewer network of total length 82.20 km including 3202manholes, (ii) Construction of 1 Unit of 5 MLD STP (SBR type); (iii) construction of one septic tank (0.03 ML capacity to cater to 275 users); and, (iv) provision of 6,206 no,s house service connections(HSCs). The proposed sewerage system isintended to cover entire town. As no suitable government land was available for the STP, a privately ownedlandhas been identified for the STP (8.25 acres) and urban local

body (ULB) has purchased this land. Public land for the septic tank has been identified by the Byadgi Town Municipality Council.The subproject will be implemented in a single package under design-build-operate scheme (DBO) for the entire town including construction of 5 MLD SBR type STP and the septic tank. At present, subproject is in detailed design stage. Septic tank design is yet to be initiated.

6. **Categorization.**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 SPS (2009).Byadgi Town Sewerage Subproject (Package No. 01BDGO1) is classified as Environmental Category B as per the SPS as no significant impacts are envisioned. Accordingly this Initial Environmental Examination (IEE)was previously prepared based on the preliminary designsfollowing ADB SPS and the environmental assessment and review framework (EARF)[1] and is nowupdated during detailed design phase. It may however be noted the detailed design of Septic Tank component has not yet initiated. IEE will be updated once the septic tank design is finalized. This IEE assesses the potential impacts due to implementation of the subproject and provides mitigation and monitoring measures to ensure no significant impacts as a result of the subproject.Septic Tank design will follow the design related measures suggested in this IEE and EMP.

7. **Description of the Environment.** Subproject components are located in Byadgi urban area or in its immediate surroundings which are in urban or agricultural use for many years. Byadgi has predominantly plain terrain sloping gently towards north/northeast, with isolated hills in south. Soils are deep, and do not require cutting of rocks for pipe laying. Byadgi has tropical climate with three distinct seasons – summer, winter and monsoon. The rainfall occurs in monsoon season mainly from June to September. April and May experience high temperatures and the lowest is recorded in the months of December and January. There are no notable streams/rivers, but there are few ponds within the town. Owning to fertile agricultural lands and favourable climate, Byadgi region is agriculturally rich and is famous for chilly cultivation. There are several chilly processing units. Town is well connected with surrounding areas and internal road network is characterized by narrow and congested lanes in the city core area, and comparatively wide roads in the outer areas. There are no environmentally-, historically-, archeologically-sensitive or tourist areas in the town sewer network will be located in existing road Right of Ways (RoWs),septic tank will be located on a government land, and a suitable private land parcel for STP has been indentified, and ULB has purchased this land from the owner.STP site is surrounded by agricultural areas. Treated water will be disposed into a stream flowing adjacent to the site. There are no protected areas, wetlands, mangroves, or estuaries in or near the subproject location. There are no forest areas within or near Byadgi. Traffic management will be necessary during pipe-laying on busy roads.

8. **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 EMP will be included in civil work bidding and contract documents.

9. Potential impacts were identified in relation to location, design, construction and operation of the improved infrastructure. Locations and siting of the proposed infrastructures

[1] Available at http://www.adb.org/sites/default/files/linked-documents/43253-024-earfab.pdf

were considered to further reduce impacts. These include (i) locating most of the facilities like sewer network and septic tank on government-owned land toavoid the need for land acquisition and relocation of people; and (ii) laying of pipes in RoWs alongside main/access roads, to avoid acquisition of land and impacts on livelihoods specifically in densely populated areas of the city. However the STPwill require 8.25 acres of private land and this hasbeenpurchased from the land owner.

10. Taking into consideration the future development around the site of the proposed STP, the following measures have been incorporated: (i) design of a compact, superior treatment process that reduce the likelihood of odour emission; and (ii) sensitive layout design and green buffer zone around the STP. Proposed septic tank site is located in the outer area of the town in a residential locality. Thick tree plantation around the septic tank to act as both visual screen and odour control is proposed.

11. During the construction phase, impacts mainly arise from pipe-laying works resulting to disturbance of residents, businesses, and increase in traffic; andthe need to dispose of moderate quantities of waste soils. These are common temporary impacts of construction in urban areas, and there are well developed methods for their mitigation. Measures such as conducting work minimizing inconvenience by best construction methods, implementing traffic management plan, exploring potential reuse for waste soils and ensuring proper site housekeeping will be employed.

12. 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. STP and septic will have negative impacts if they are not operated as per the design and process adopted, including periodic and preventive maintenance. Given the location of septic tank close to the residential area, proper operation and maintenanceis necessary to avoid malfunction and resulting nuisance. These are duly considered in the subproject operation.

13. 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.

14. **Consultation, Disclosure and Grievance Redress.**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 subproject. The IEE will be made available at public locations in the city and will be disclosed to a wider audience via the ADB and KUIDFC 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.A grievance redress mechanism is described within the IEE to ensure any project-related grievances are addressed quickly.

15. **Monitoring and Reporting.** The PMU, PIU, and PMDCS consultants will be responsible for monitoring. The PMDCSCwill submit monthly monitoring reports to PMU, and the PMU will

send semi-annual monitoring reports to ADB. ADB will post the environmental monitoring reports on its website.

16. **Conclusions and Recommendations.**The citizens of the Byadgi City will be the major beneficiaries of this subproject. In addition to improved environmental conditions, the project will improve the over-all health condition of the town. Diseases of poor sanitation, such as diarrhoea and dysentery, will 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.

17. The most noticeable net environmental benefits to the population of the towns will be positive and large as a result of improved: (i) improved health and economic conditions of the people; and (ii) improved surface water quality as the sewage generating in the town will be carried by the sewer networks to the STP for treatment and safe disposal.

18. The proposed subproject is unlikely to cause significant adverse impacts. The potential impacts that are associated with design, construction and operation can be mitigated without difficulty through proper engineering design and application of recommended mitigation measures and procedures. Based on the findings of the IEE, there are no significant impacts and the classification of the subproject 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).

I. INTRODUCTION

A. Introduction to KIUWMIP

1. The Karnataka Integrated Urban Water Management Investment Program (KIUWMIP, the Program) aims to improve water resource management in urban areas in a holistic and sustainable manner. Investment support will be provided to modernize and expand Urban Water Supply &Sanitation (UWSS) while strengthening relevant institutions to enhance efficiency, productivity and sustainability in water use. The Program focuses on priority investments and institutional strengthening in water supply and sanitation within an Integrated Water Resource Management (IWRM) context.

2. The Program will be implemented over a period of ten years from 2014 to 2024 and will be funded by a loan via the Multitranche Financing Facility (MFF) of Asian Development Bank (ADB). The executing agency is the Karnataka Urban Infrastructure Development Finance Corporation (KUIDFC) and implementing agencies will be respective participating Urban Local Bodies (ULBs). Initially Byadgi, Harihar, Ranebennur and Davangere are the four towns chosen to benefit from the first tranche of the investment. Later only three towns Byadgi, Harihar,andDavangere are considered for tranche-1 funding.

3. The expected outcome will be improved water resource planning, monitoring and service delivery in 3 towns of the Upper TungaBhadra sub basin. Tranche 1 will have 3 outputs; (i) expanded efficient Urban Water Supply & Sanitation (UWSS) infrastructure in 3 towns of the Upper TungaBhadra sub basin; (ii) Improved water resource planning, monitoring and service delivery in Karnataka; and (iii) KUIDFC strengthened capacity.

4. Byadgi Town Sewerage Subproject (Package No. 01BDGO1) is one of the subprojects proposed in Tranche 1. The subproject will be implemented on a design-build-operate scheme (DBO).

5. **Subproject Scope**. Byadgi Town Sewerage Subproject (Package No. 01BDGO1) will address gaps in sewerage and sanitation infrastructure to meet the design demand. The Sewerage generation estimated for the intermediate design year (2031) is 5.0 MLD and for the ultimate design year (2046) is 6.70 MLD.The procurement plan includes (i) new sewer network of total length 82.20 km including 3202 manholes (ii) construction of 1 Unit of 5 MLD STP (SBR type); (iii) construction of one septic tank (275 users, 0.03 ML); and, (iv) provision of 6,206 no,s HSCs. The proposed sewerage system is intended to cover entire town. Private land will be required for the STP (8.25 acres) and urban local body (ULB) has purchased this land. Public land for the septic tank has identified by the Byadgi Town Municipality Council.

B. Background of IEE

6. ADB's Safeguard Policy Statement (SPS), 2009, requires the consideration of environmental issues in all aspects of the Bank's operations. This states that ADB requires environmental assessment of all project loans, programme loans, sector loans, sector development programme loans, financial intermediary loans and private sector investment operations.

7. **Screening andCategorization.**The ADB Rapid Environmental Assessment (REA)Checklist for Sewage Treatment was used to screen the subproject for environmental impacts and to determine the scope of the environmental assessment required. The completed Checklist is given in **Appendix 1.** All the Byadgi Town Sewerage Subproject (Package No. 01BDGO1)components will interact physically with the environment. Results of the REA Checklist shows, there is no significant impacts are envisioned thus Byadgi Town Sewerage

Subproject (Package No. 01BDGO1) is classified as Environmental Category B as per ADB SPS. Accordingly this Initial Environmental Examination (IEE)was previously prepared based on the preliminary designs following ADB SPS and the environmental assessment and review framework (EARF)[2] and is now updated during detailed design phase. It may however be noted the detailed design of Septic Tank component has not yet initiated. IEE will be updated once the septic tank design is finalized. This IEE assesses the potential impacts due to implementation of the subproject and provides mitigation and monitoring measures to ensure no significant impacts as a result of the subproject. Septic Tank design will follow the design related measures suggested in this IEE and EMP.

C. Scope of IEE

8. The IEE was based mainly on secondary sources of information and field reconnaissance surveys; no field monitoring (environmental) survey was conducted.

D. Report Structure

9. This Report contains eight (10) sections including this introductory section: (i) Introduction; (ii) Environmental regulatory compliance, (iii) Description of Project components; (iv) Description of the environment; (v) Screening of potential environmental impacts and mitigation measures; (vi) Public consultation and information disclosure; (vii) Environmental Management Plan; (viii) Grievance Redress Mechanism, and (ix) Finding and recommendation; and (x) Conclusions.

II. ENVIRONMENTAL REGULATORY FRAMEWORK

A. National and State Regulations

10. **Table 1** presents a summary of environmental regulations and mandatory requirements applicable to the subproject.ULBwill be initiating to take necessary actions to obtain required clearances and permits; and will ensure these are obtained. IEE will be updated after final design, which is to be done by DBO contractor.

Table 1:Applicable Environmental Regulations

Law	Description	Requirement
EIA Notification	The EIA Notification of 2006 and 2009 (replacing the EIA Notification of 1994), set out the requirement for environmental assessment in India. This states that 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 impacts. Category A projects requires Environmental Clearance from the Ministry of Environment and Forest (MoEF). Category B projects require Environmental Clearance from the State Environmental Impact Assessment Authority (SEIAA).	Sub project is not a listed activity in Schedule I of this notification and hence environmental clearance is not required.
Water	Control of water pollution is achieved through	Construction of STP will

[2] Available at http://www.adb.org/sites/default/files/linked-documents/43253-024-earfab.pdf

Law	Description	Requirement
(Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments	administering conditions imposed in consent issued under provision of the Water (Prevention and Control of Pollution) Act of 1974. These conditions regulate the quality and quantity of effluent, the location of discharge and the frequency of monitoring of effluents. Any component of the Project having the potential to generate sewage or trade effluent will come under the purview of this Act, its rules and amendments. Such projects have to obtain Consent For Establish (CFE) under Section 25 of the Act from Karnataka State Pollution Control Board (KSPCB) before starting implementation and Consent For Operate (CFO) before commissioning. The Water Act also requires the occupier of such projects to take measures for abating the possible pollution of receiving water bodies.	requireCFE and CFO from KSPCB. CFE is already obtained. Attached as **Appendix 2** of this report. After completion of construction, CFO is issued confirming compliance with the CFE conditions, if any Allrelevantforms,prescribedfeesandproceduresto obtaintheCFEandCFOcanbefoundintheKSPCBwebsite(www.kspcb.gov.in).
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	The projects having potential to emit air pollutants into the atmosphere have to obtain CFE under Section 21 of the Air (Prevention and Control of Pollution) Act of 1981 from KSPCB before starting implementation and CFO before commissioning the project. The occupier of the project/facility has the responsibility to adopt necessary air pollution control measures for abating air pollution.	For the subproject, the following will require CFE and CFO from KSPCB: (i) diesel generators; (ii) hot mix plants; and (iii) stone crushers, if installed for construction. DBO contractor will be responsible for obtaining CFE for construction-related air pollution sources. All relevant forms, prescribed fees and procedures to obtain the CFE and CFO can be found in the KSPCB website (www.kspcb.gov.in). Procure generators only from approved manufacturers/ suppliers, the manufacturer/ supplier shall be registered with the CPCB and shall have valid certificates for “Type Approval” and “Conformity of Production”. Provide emission stack of requisite height and other measures as per the CFE issued by KSPCB
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 notified.**Appendix 3** provides applicable standards for ambient air quality.	DBO contractor to ensure standards are complied.
Noise Pollution (Regulation and Control) Rules, 2000 amended up	Rule 3 of the Act specifies ambient air quality standards in respect of noise for different areas/zones.**Appendix4**provides applicable noise standards.	DBO contractor to ensure standards are complied.

Law	Description	Requirement
to 2010.		
Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010	The Amendment Act designates areas within 100 meters (m) from the "protected property" 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" in the "regulated area" requires prior permission of the Archaeological Survey of India (ASI). "Protected property" includes the site, remains, and monuments protected by ASI or the State Department of Archaeology and "construction" means the construction of any structure or building.	There are no protected properties near project area in Byadgi. However, in case of chance finds, the DBO contractors will be required to follow a protocol as defined in the Environmental Management Plan (EMP).
Land Acquisition Act of 2013	Private land acquisition is guided by the provisions and procedures in this Act. The District Collector or any other officer designated will function as the Land Acquisition Officer on behalf of the Government. There is a provision for consent award to reduce the time for processing if the land owners are willing to agree on the price fixed by the Land Acquisition Officer.	The ULB has already purchased the private land required for the STP and the approach road, therefore, further land acquisition is not required.
Labor Laws	**Appendix 5** provides applicable labor laws including amendments issued from time to time applicable to establishments engaged in construction of civil works.	The DBO contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements.The DBO 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 DBO contractor shall provide equal wages and benefits to men and women for work of equal value or type.
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.	Not applicable to the subproject as no wetlands are present in the subproject area.
Wildlife Protection	This overarching Act provides protection to wild animals, birds, plants and matters connected	Not applicable to the subproject as (i) the components are not located

Law	Description	Requirement
Act, 1972	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.	in protected area; (ii) there are no wildlife/protected fauna or flora in the subproject area and nearby.
Forest (Conservation) Act, 1980	The Forest (Conservation) Act prevents the use of forest land for non-forest uses without the clearance from Ministry of Environment,Forests and Climate change (MoEFCC), Govt. of India	Not applicable to the subproject as there areno forest areas within or adjacent to the project area.
Karnataka Forest Act, 1963 and Karnataka Forest Rules, 1969	This Act makes the basis for declaration of Reserved Forests, constitution of village forest committees, management of reserved forests and penalties and procedures.	Not applicable to the subproject as there areno forest areas within or adjacent to the project area.
Karnataka Preservation of Trees Act, 1976 and Karnataka Preservation of Trees Rules, 1977	This Act has put restriction on felling of trees in the State unless until permitted by the Tree Officer. Any person desiring to fell a tree shall apply in writing to the tree officer for permission in that behalf. It further defines clauses for planting adequate number of trees, planting in place of fallen/destroyed trees, preservation of trees and adoption of trees.	Tree to be cut will be enumerated and application to be submitted in required format as per the Act by the DBO contractor. Compensatory plantation as stipulated in the tree cutting permission shall be adhered to.

11. The CFE issued by KSPCB lays down the following conditions:,

- Project proponent (Town Municipal Council (TMC) of Byadgi) to ensure that there shall not be any odour nuisance in the surrounding area due to the operation of the STP. Sufficient green belt shall be developed around the STP site
- The TMC shall treat sewage to the standards (attached CFE in Appendix 2) stipulated The TMC shall utilize the treated sewage for irrigation purpose after treating the same to the stipulated standards
- The solid wastes collected in the treatment plant premises in the form of general garbage shall be disposed off sufficiently to the satisfaction of the Board so as not to cause fugitive emissions, dust problems or water pollution through leaching etc. of any kind
- The authority shall immediately report to the board of any accident or unforeseen act or event resulting in release of discharge of effluents or emissions or solid wastes etc., in excess of standards stipulated and the authorities shall immediately take appropriate corrective and preventive actions under intimation

B. ADB Policy

12. ADB SPS stipulates addressing environmental concerns, if any, of a proposed activity in the initial stages of project preparation. For this, the ADB SPS classifiesthe proposed subprojectintocategory 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: Project components with potential for significant adverse environmental impacts. An Environmental Impact Assessment (EIA) is required to address significant impacts.

(ii) Category B: Project components judged 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: Project components unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are still reviewed.

13. TheREA Checklist for Sewage Treatmentwas used to screen the subproject for environmental impacts and to determine the scope of the environmental assessment required. The completed Checklist is found in **Appendix 1**. Results of the REA Checklist show no significant impacts are envisioned thus Byadgi Town Sewerage Subproject (Package No. 01BDGO1) is classified as Environmental Category B as per ADBSPS.This IEE has been updated as per the final design of the subprojectfollowing ADB SPS and the EARF of the program[3]. This IEE assesses the potential impacts due to implementation of the subproject and provides mitigation and monitoring measures to ensure no significant impacts as a result of the subproject.

III. DESCRIPTION OF THE PROJECT COMPONENTS

14. Byadgi Town is located in Karnataka State of India, at a latitude of 14°41'18" N and longitude of 75°29'19"E, at an average altitude of 630 m above the mean sea level (Fig 1).

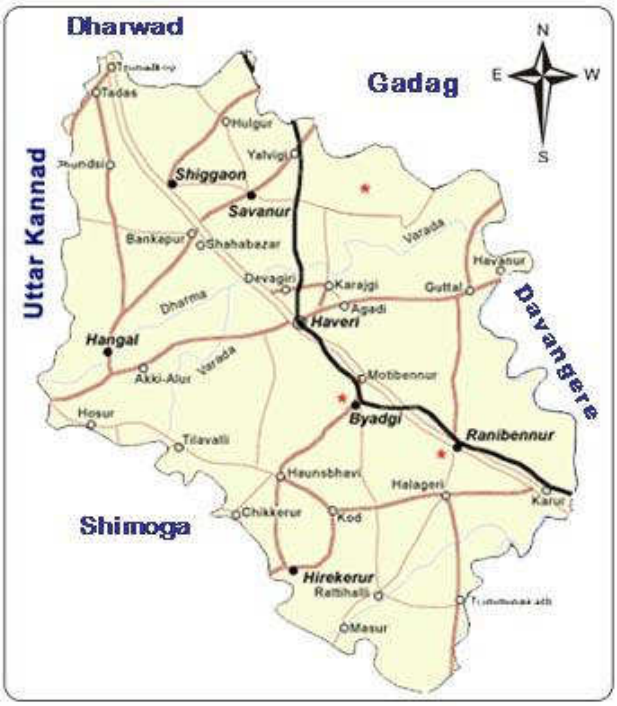


Figure 1: Location map of Byadgi

[3] Available at http://www.adb.org/sites/default/files/linked-documents/43253-024-earfab.pdf

A. Need for Infrastructure Improvement inByadgi

i. Existing Waste Water Collection and Treatment

15. There is no existing underground wastewater collection system and wastewater treatment plant in Byadgi. The wastewater from most of the properties is connected to the storm water drains and water bodies. The wastewater from the town ultimately reaches the stream which is flowing on the north of the town. The projected wastewater flows generated in Byadgi are 5.0 MLD and 6.7 MLD for the years 2031 and 2046 respectively. There are no wastewater treatment facilities in Byadgi to treat wastewater generated from the town. It is noticed that, the wastewater from the stream is being used for irrigation on the downstream of Byadgi.

ii. Problems relating to the Existing Sewer Network

a) There is no Sewage collection and Treatment system.

b) Some of the houses are provided with individual septic tanks and there are a few public toilets. Sewage flows into the septic tanks and its supernatant overflows into the storm water drains.

c) **Disposal of Domestic Sewage**: In many parts of the city sewage, sullage and storm water from residential area are presently discharged into open drains / channels, which are in turn joins the water bodies, ultimately polluting the fresh water bodies available within the city limits.

d) **Individual Latrines**: There are 6017 private latrines existing in the town. There are no latrines in 1301 houses and the residents use public latrines or defecate in the open. The effluent of septic tanks is flushed into the open drains or low lying areas.

e) **Areas with No Latrines**. Many isolated small areas and some places in major areas have no latrine facility and hence people are practicing open defecation.

f) **Public Latrines**: There are 5 public latrines in the town. Number of seats provided in these latrines is 25. Maintenance of public toilets is not satisfactory. Water supply is not regular. Discharge from the toilet sometimes flow in open drain.

g) **Areas with no latrine**: Isolated areas and some other areas in the town, does not have any latrine, and so people answer the nature's call in the open. Sewerage facility will have to bedesigned to take care of the Town in the following aspects**.**

- To provide a lasting solution to the problem of effective handling of sullage and sewage generated by implementing an underground sewerage system for the areas duly considering the requirements for the next 30 years.
- Providing the sewer network to carry anticipated flows in year 2046.
- Providing sewage treatment plant to take care of year 2046 demand and constructing it at suitable locations so that entire sewage can be drained into the plants as far as possible by gravity.

h) **Treatment facilities:**Byadgi Town does not have a sewerage system. There are 6017 individual septic tanks with households. There is one community toilet also with 25 seats. Sometimes the overflow from the septic tank discharged in the drain.

B. Description of the Subproject

16. Following table provides the details of subproject components. The descriptions shown in are based on the proposals at detailed design stage. The Comprehensive diagram for the sewer network of the town is in **Figure 2** and the Layout of the STP plant and flow diagram are given as **Figure 3** and **4** and the design of the septic tank is given in **Figure 5.**

Table 2A: Proposed Subproject Components

Infrastructure	Function	Description	Location
Sewer network including manholes and house service connections	Collect wastewater from dwelling units and convey by gravity to the STP for treatment	82. 2 km sewer network including 2.9 km trunk main, 2.07 km sub main, and 77.23 km lateral. Diameter wise details provided below: *RCC pipes* • 150mm dia - 2.56 km • 200mm dia - 0.315 km • 250mm dia - 0.24 km • 300mm dia - 1.567 km • 350mm dia - 0.614 km • 400mm dia - 0.509 km • 450mm dia - 0.349 km • 600mm dia - 1.928 km *uPVC pipes* • 160mm dia- 70.986 km • 200mm dia- 1.212 km • 250mm dia- 1.912 km • 3,202 manholes (Brick masonry and RCC precast) • 6,206 house service connections	Sewers will be laid underground along the roads/streets within the road right of way. Sewer network will cover entire town.
Terminal sewage pumping station	Collect sewage and pump to STP inlet	7 m internal diameter RCC well is constructed. It is proposed to install five pumps of 180 cum/hr	Terminal Wet well will be constructed within the STP site,
Sewage treatment plan	Treatment of collected effluent to comply with disposal standards	5 MLD capacity Treatment process – SBR based with the following units • Inlet chamber, • Fine Screen Channel, • Grit Chamber, • SBR units (SBR basin, Decanting Device, aeration system, Return sludge and excess sludge pumps,	Proposed STP site is located at Teradahalliapproximatel y1.5 km in North west direction of Byadgi. Presently site is vacant and is surrounded by agricultural lands. No habitation/ sensitive

		automation and control), • Disinfection unit, • sludge dewatering unit • Blower Room, DG Room • Laboratory • Admin Building,	areas nearby. A natural nallah flows near the STP site. Presently all the wastewater of town is disposed into thisnallah.Treatedwaste waterfrom STP will be disposed into this nallah. Nallah starts from Byadgi town and flows till Homardi lake covering a distance of approximately 9.5 km. The Nallah is almost dry throughout the year except in rainy season and is adequate to carry 5 MLD capacities.
Diesel Generator	Provide alternative power supply for emergencies	250 KVA capacity diesel generator with a provision of 5 m height emission stack Generator room will be developed as per the KSPCB CFE conditions	Generator room will be constructed within the STP site, and will provide power supply to both sewage pumping station & STP.
Septic Tank	On site treatment of sewage in areas not feasible to connect to sewer system & STP	Capacity of septic tank: 0.03 MLto cater to a design population of 275 in Ward 23. Septic tank effluent will be passed through a gravity filter before it being disposed into a drain.	Proposed Septic Tanksiteis situated atAgasanahalli besides the existing public toilet, which is currently not in use. Site is not a low lying/flood prone area. Nearby house is 10 m away from the site.

17. **New Sewer Lines:**Sewer laterals are proposed along all roads in the town in order to capture thesewage flow from residential areas at different parts of the town connecting to theproposed Sub-mains or Trunk sewers; so that all area in Byadgi town would becovered by Sewerage system after the implementation of the project. Total 82.20 km of sewer line network is proposed under this sub project.

18. **Manholes:** Manholes provide access to sewers for inspection and cleaning. Manholes are located at every change of alignment, grade or diameter, at the head of all sewers and branches and at every junction of two or more sewers. Spacing of manholes depends upon type of sewer cleaning equipment's viz., manually operated or by mechanical devices. On sewers,

the maximum distance between manholes should be 30 m. This is adopted in design of this sub project. The total number of manholes proposed in this sub project is 3202.

19. **Sewage Pumping Station:**A terminal pumping station will be constructed at STP premises. The sewage is collected from gravity trunk lines in the wet well and after preliminaryscreeningsewage is pumped to the inlet of the sewage treatment plant for treatment.

20. **STP**:The population of Byadgi Town is expected to be close to 33,250 by 2016 which is likely to grow to about 59,065 by 2046. The corresponding sewage flows expected will be 3.77MLD in year 2016 to 6.70 MLD in year 2046. The estimated average sewage flow for Byadgi TMC for intermediate stage (2031) is 5.0 MLD. The treatment facility of 5.0 MLD is required by 2031 and it is proposed to provide 5.0MLD treatment capacity for the Town. SBR based STP is recommended since SBR technology requires comparatively much lower areas with same efficient results as that of extended aeration. The main advantage of the SBR plant is that the effluent shall be of high quality. STP is located at Teradahalli, ByadgiTaluka, Haveri district. Presently area is open surrounded by agricultural land. One nallah is located near the proposed STP land, into which treated wastewater will be disposed..

21. **Disinfection of Treated Effluent:** Treated sewage from Sequencing Batch Reactor (SBR) Units shall be collected in a Chlorination Tank where disinfectant will be added at suitable dosing rate for disinfection. Baffle walls shall be provided in the Tank to facilitate hydraulic mixing of treated sewage. Adequate reaction time shall be provided to ensure proper disinfection of treated sewage. Chlorinated effluent from Chlorination Tank shall be discharged into the nearby Nallah (Natural drain) by RCC Channel / RCC Pipe through gravity

22. **Sludge Dewatering**: Excess Sludge from SBR Basins shall be withdrawn through Sludge Withdrawal System and collected in the Sludge Sump. The sludge shall be then pumped to Centrifuges for dewatering using positive displacement type Screw Pumps. Dewatering Polyelectrolyte Dosing System comprising one Solution Preparation and One Solution Dosing Tank equipped with slow speed Mixers and mechanically actuated diaphragm type Metering Pumps shall be provided to dose Dewatering Polyelectrolyte Solution online.The dewatered sludge in the form of wet cake from centrifuge shall be collected directly in a tractor trolley placed below the decanter room, and will be transported to compost plant for drying. Dried sludge is proposed to be blended in the compost plant of the Byadgi Municipality, and will be further used as agriculture soil filler. The capacity of the compost plant is 2.5 MTD. The liquid concentrate from centrifuge shall be collected in a concentrate tank and recirculated to the Inlet Chamber of STP.

23. The major components of the STP are i)Inlet chamber, ii) Fine Screen Channel, iv) Grit Chamber, iii) SBR units (SBR basin, Decanting Device, aeration system, Return sludge and excess sludge pumps, automation and control), iv) Disinfection unit, sludge dewatering unit The design details of these components as per DPR are given in the following **Table 2**. The designs will be finalized by the DBO Contractor.

Table 3: Specifications of Major Components of STP

No.	Process Unit	Qty	Length (m)	Width (m)	SWD (m)	Free Board (m)
1	Stilling Chamber	1	1.5	1.5	2.0	0.50
2	Fine Screen Channel, Mechanical	1	6.5	0.65	0.65	0.30
3	Fine Screen Channel –	1	6.5	0.65	0.65	0.30

	Manual					
4	Grit Chamber – Mechanical	2	4.0	4.0	0.90	0.30
5	SBR Basin	2	26.50	13.25	6.50	0.50
6	Chlorination Tank	1	10.0	6.00	4.00	0.50
7	Sludge Pump	1	6.00	4.00	3.50	0.50
8	Centrate Sump	1	3.00	3.00	3.00	0.50
Buildings						
Sl. No	**Buildings**	**Qty.**	**Length m**	**Width m**	**Height m**	**Remarks**
1	HT Substation	1	10.00	10.00	4.00	
2	DG Set House	1	10.00	5.00	6.00	
3	SBR Air Blower cum Admin cum MCC & Control Building	1	15.00	10.00	8.00	G+1
4	Chlorination cum Chlorine Tonner House (Above Chlorination Tank)	1	6.00	5.00	6.00	
5	Centrifuge House	1	7.00	6.00	8.00	Stilt +1
6	Security Cabin	1	3.00	3.00	3.00	

24. **Septic Tank:** Agasanahalli Nagar area (Ward No.23) is not feasible to connect to the main sewer network leading to STP because of its low laying terrain nature; therefore, it has to be provided with independent treatment system like Septic Tank.The projected population of Agasanahalli Nagar for the year 2046 is 275, and the expected sewage generation (assuming water supply @ 135 lpcd) @ 108 lpcd is 0.03 ML. The septic tankwill bedesignedas per the Indian Standard Code (IS Code) 2470, part 1. After treatment in the septic tank, the treated effluent will be passed through a gravity filter for capturing the suspended solids and then it is proposed to be discharge into the nearby nallah. As the design of septic tank is not yet initiated, no details on the raw and/or treated sewage is not available. However it will be ensured that adequate treatment is ensured in septic tank and then passing through the gravity filter so that there is no negative effect on the environment or public health.

25. The accumulated septage / sludge from the septic tank will be collected once a year using mobile sucker tankers, transported and discharged into the wet well in the STP complex. It is proposed to empty the sludge into wet well over a period of 12 hours for dilution. In the wet

well it will mix with the raw sewage, and will be treated in the STP. The estimated quantity of septage/sludge generated from the septic tank is 210 Kg per year (as per CPHEEO norms)

26. **House Service Connections (HSC):** It has been decided that the provision of house service connections needs to be done by the ULB. The number of household estimated through population project at the time of implementation of this subproject (2016) is 6206, and hence provision given for 6206 HSCs. The house service connection pipe line will be laid upto the edge of the property boundary.

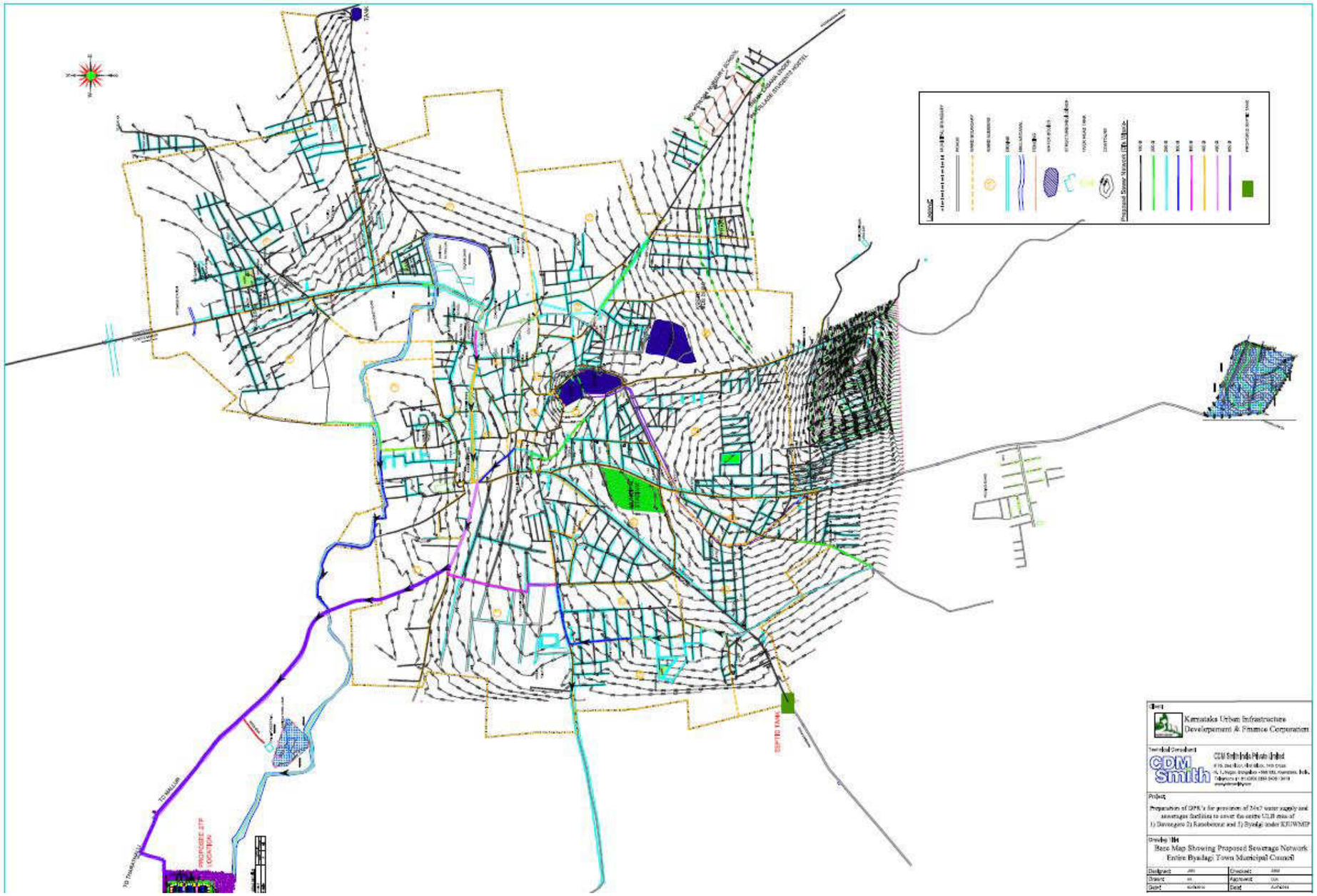
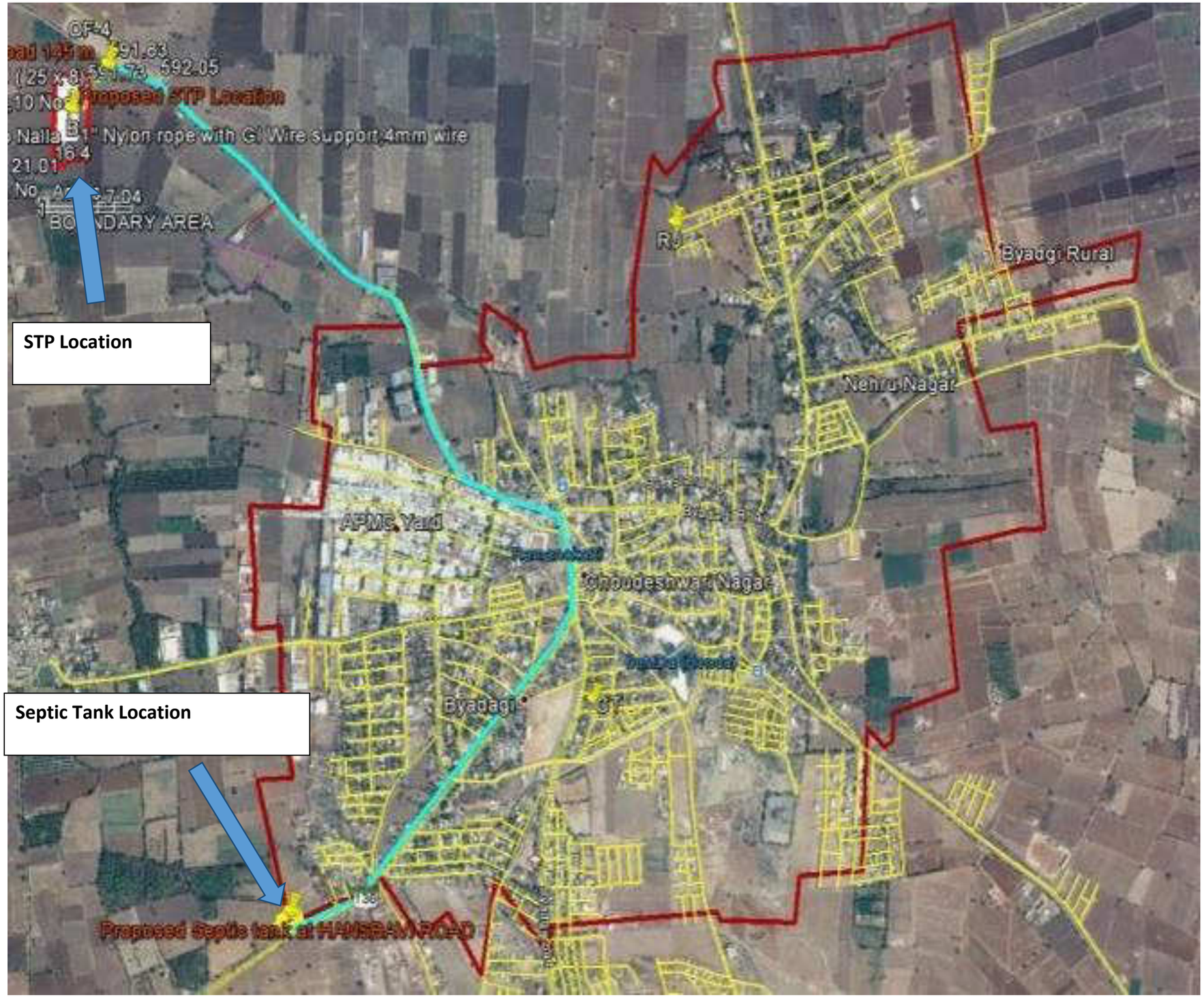


Figure 2: The Comprehensive Plan of Sewerage System in Byadgi City


OF-4
Proposed STP Location
Nylon rope with G. Wire support 4mm wire
BOUNDARY AREA
STP Location
Byadgi Rural
Nehru Nagar
APMC Yard
Choudeshwari Nagar
Byadagi
Septic Tank Location

	
Proposed STP location Byadgi	**Proposed Septic Tank Site**
	 
Trunk sewerage main root	**Septic Tank Site Surroundings**
	
Demarcation of land through display board	**Agricultural land nearby the proposed STP location**

Figure 3: Location of the Sub Project Components

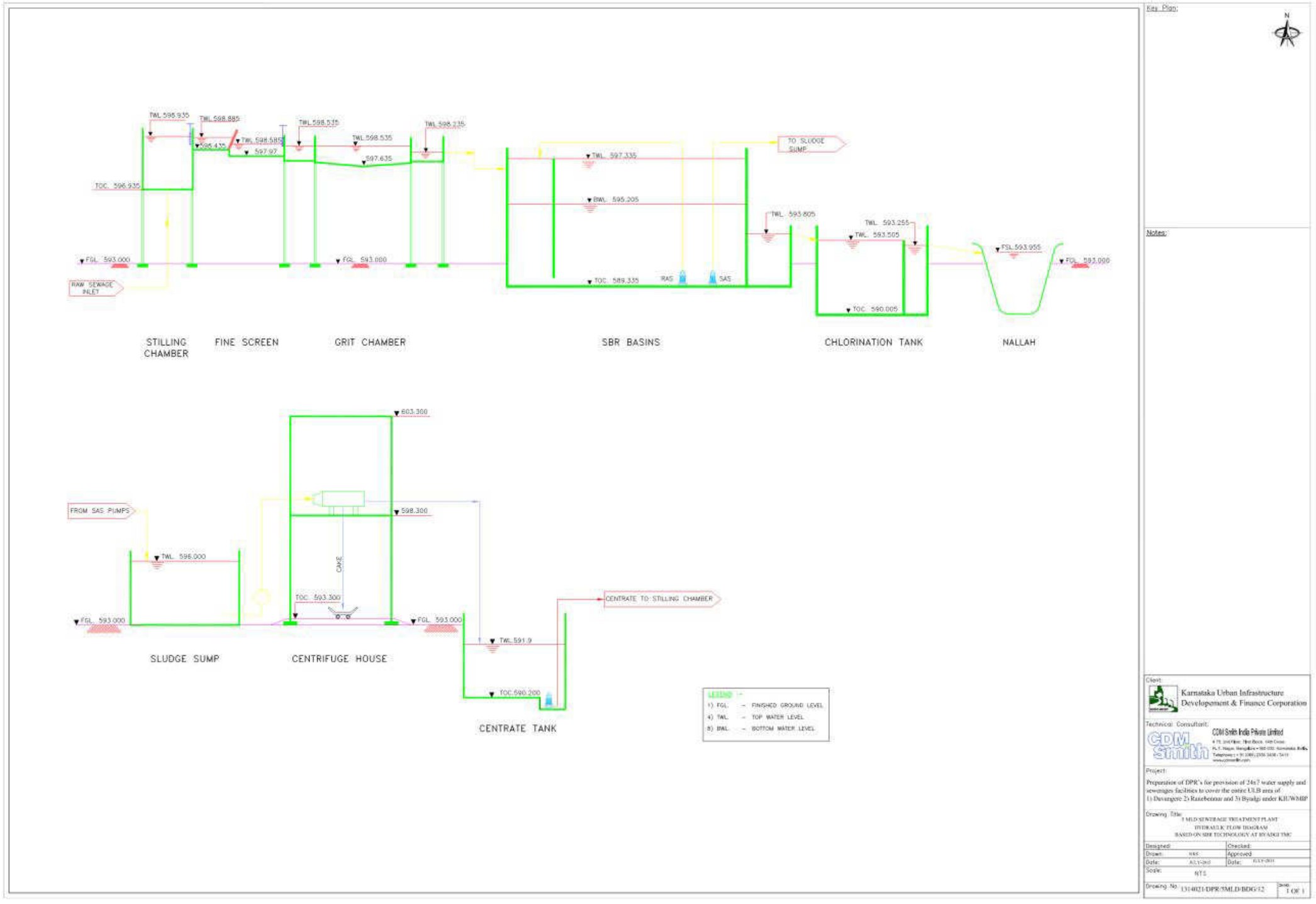


Figure 4: Hydraulic / Process Flow Diagram of 5 MLD STP plant at Byadgi

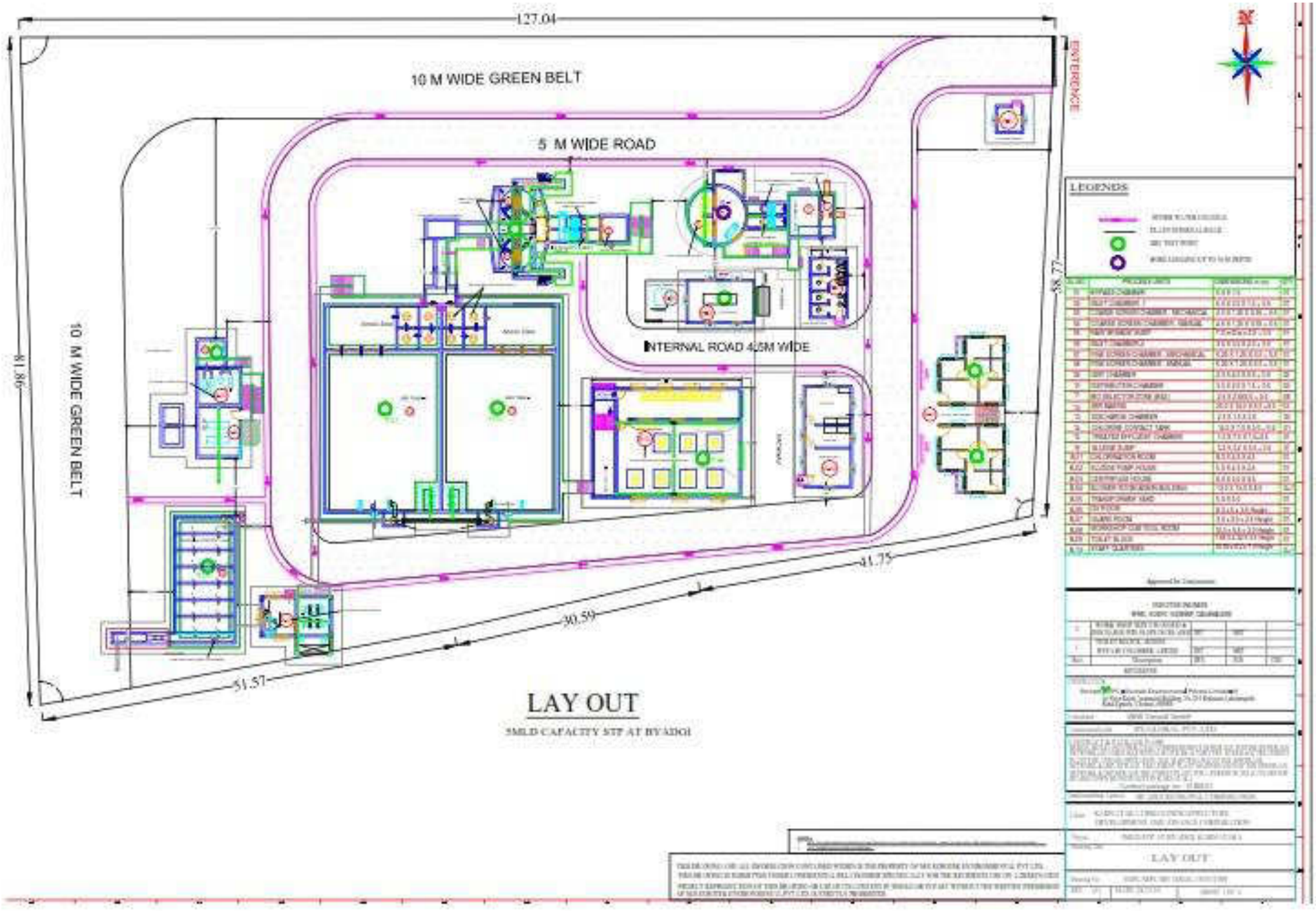


Figure 5: Layout Plan of Proposed STP at Byadgi

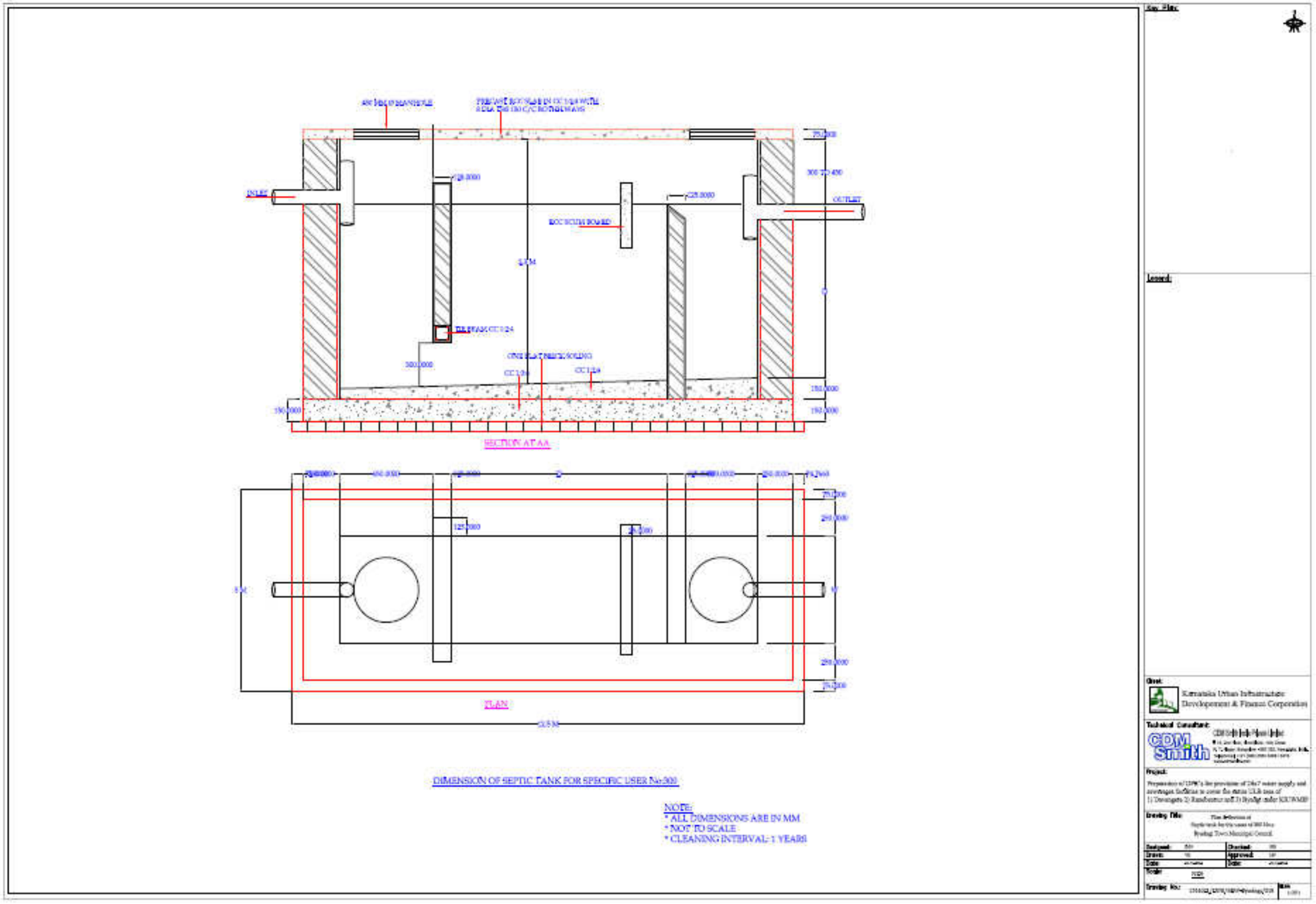


Figure 6 : Diagram for Septic Tank

Implementation Schedule.

27. As per the suggested schedule, preparation of detailed project report and bids for this subproject commenced on2015. Construction activities of construction of sewerage network, STP and septic tank subproject are likely to start in November2016, and should be completed in 36 months. Operation and Maintenance of sewerage network, STP & septic tank is for 6 years after the completion of the contract. The tentative schedule is given below:

Completion of DPR	-	September 2015
Tender issue	-	September 2015
Contract Award	-	March2016
Commencement of work	-	November 2016
Completion of work	-	April 2019
Operation and Maintenance	-	April2025 (6 years)

IV. DESCRIPTION OF THE ENVIRONMENT

A. Physical Conditions

i) Location

28. Byadgi is located in Haveri District. Geographically, Byadgi Town is located at a latitude of 14°41′18" N and longitude of 75°29′19"E. The town is located 10 km away from National Highway (Pune-Bangalore).

29. Byadgi has the status of Town Municipal Council (TMC). The town is divided into 23 wards and spreading to an area of 4.20 sq. Km.

ii) Topography, Soil & Geology

30. The town is located on plain terrain. The town has two types of soil – hard red sandy soil in southern part and medium black and deep black cotton soil in northern part. The red loamy soil and laterite soil are seen in very small parts on Southern border of the district. This type of soil favours cotton and groundnut cultivation.Geology consists of Ranebennur group of Dharwad rock formationand consists more of gravel and chlorite phylites. The bases of these rocks are less distributed and have only small cracks.

31. The average ground level is 630 m above MSL. There is isolated pocket in the south which is 696 m above MSL.As per the seismic zoning map of India, Byadgi Town falls under the zone II, which is the lowest earth quake risk zone in India. The zone is terms as "Low Damage Risk Zone"

iii) Climate

32. Byadgi has a tropical climate characterized by general dryness except during monsoon and blessed with a good and healthy climate throughout the year. The average annual rainfall of Byadgi is 750 mm. The rainfall occurs in monsoon seasons from June to September.

33. Byadgi experiences slight variation in temperature across the year. April and May experiences high temperature and the lowest is recorded in the months of December and January. The average maximum and minimum temperatures are 36oC and 22oC respectively. The relative humidity is high during monsoon, 80.7 % and less in Feb 55 %.

34. During January and February the wind blow predominantly from south east to south, March and April being transitional the south-easterly winds are gradually replace with northwest or westerly winds. From April to September the winds are predominantly from northwest or west direction, in October the reversal of direction is completed and during November – December wind blow predominantly from east to south east. The wind speed ranges from 7.0 to 19.6 kmphand average speed is 11.4 kmph.The climate profile of the Byadgi is given in **Table 4**

Table 4: Climate Data of the Byadgi

Month	Rain (mm)	Temperature (°C)			Relative Humidity (%)	Wind Speed (KMPH)
		Max	Min	Mean		
Jan	0.6	30.7	15.9	23.3	61.1	5.9
Feb	1.0	32.6	17.7	25.2	57.9	6.1
Mar	4.2	35.1	20.4	27.8	55.1	5.6
Apr	44.7	36.2	22.8	29.5	56.8	5.7
May	86.6	35.3	23.3	29.3	62.3	7.2
Jun	94.3	30.9	22.3	26.6	70.6	10.0
Jul	156.8	28.9	21.9	25.4	79.6	10.5
Aug	97.3	28.5	21.6	25.0	80.7	9.3
Sep	99.6	29.7	21.2	25.5	77.6	6.7
Oct	114.3	30.4	20.8	25.6	74.3	6.0

Nov	41.0	30.3	18.7	24.5	67.9	5.4
Dec	6.8	30.0	16.4	23.2	63.4	7.1

Source: Indian Meteorological Department

iv) Air Quality

35. The major sources of sound pollution in the city are from the vehicles. Karnataka State Pollution Control Board (KSPCB) monitors air and noise pollution in the State in line with Air (Prevention and Control of Pollution) Act, 1981. KSPCB have monitoring stations located at various places across the state; however it covers major cities and industrial locations only. There are no regular monitoring stations in Byadgi.

36. Byadgi is a small town with limited urbanization and traffic density. There are no major industries around Byadgi. Hence the air pollution is comparatively low compared to other towns in the district. Vehicular emission and dust pollution are high on the main roads and commercial places. Before implementation of the project and after detail design base line air and noise qualitymonitoring needs to be done to cover project locations.

v) Surface Water

37. There are no notable rivers and streams in and around the Byadgi town. Hombaraddikere (Lake) is the major water body near to Byadgi town in addition to few small tanks in the town limit. None of these water bodies are located near to the location identified for STP or Septic Tank. The water from the town drains into Shanbogarnnalla, which flows from east to west and carries runoff to Hombaradikere. The proposed sewer lines are not crossing any water courses or abutting any water bodies.

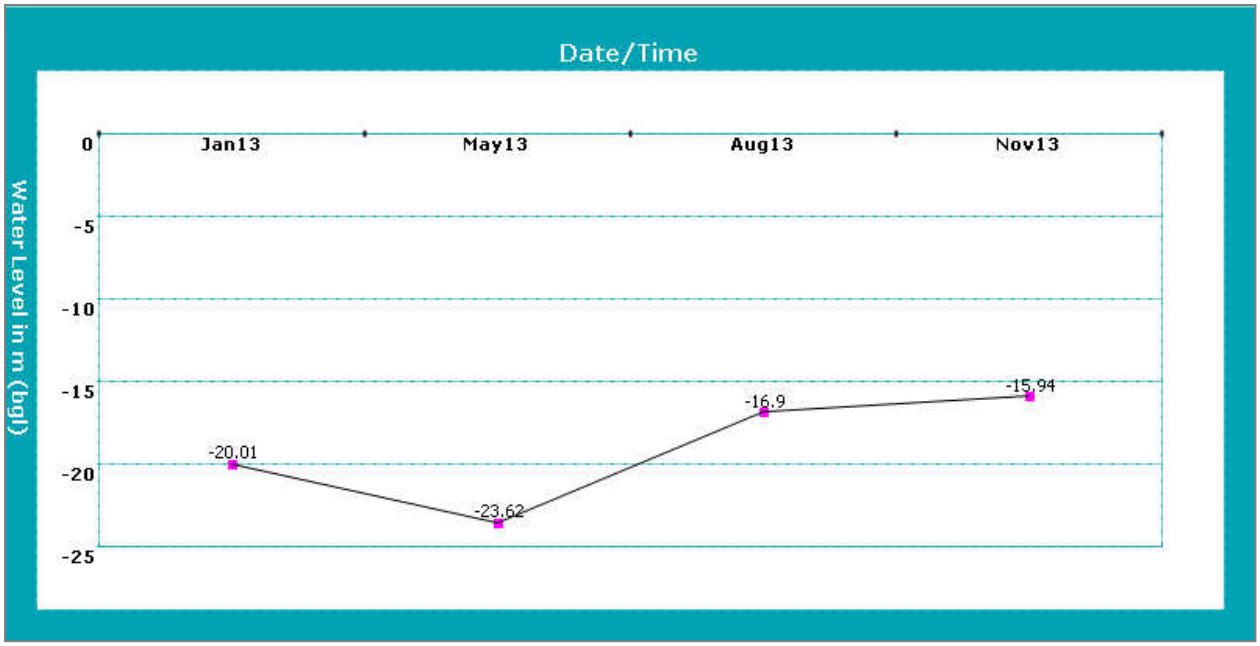
vi) Ground Water

38. The ground water development varies from 64 % to 92 % for ByadgiTaluk as on year 2012. In the study conducted by Central Ground Water Board (CGWB), chloride problem was observed in ByadgiTaluk. Table 5 gives the Ground Water Table status for Byadgi

Table 5: Groundwater Development in ByadgiTaluk

Particulars		Details (in mcm)
Recharge from Rainfall during monsoon season		19.57
Recharge from other sources during monsoon season		28.24
Recharge from Rainfall during non-monsoon season		13.19
Recharge from other sources during non-monsoon season		10.94
Net annual ground water availability		65.25
Gross ground water draft for all users		62.55
Stage of Development		96 %
Categorization (as on March 2009)	Safe Area	20 %
	Over Exploited Area	80 %

39. As per the study conducted by CGWB, the ground water level in Byadgi area during the Pre-Monsoon period (May 2006) is 10-20 mbgl and that post monsoon period (November 2006) is 5-10 mbgl. The nearest Ground Water level monitoring station of CGWB is Motebennur (situated 4 km towards north of Byadgi town) and the ground water level fluctuation of Motebennur for the year 2013 is given in the Figure 6 below. The highest level of ground water level is 15 mbgl at Motebennur.



Source: CGWB

Figure 7 : Seasonal fluctuation of ground water level of Motebennur

B. Ecological Resources

40. The distribution of forests in Haveri district is uneven. The eastern part of the division comprising of Ranebennur, Haveri and Byadgi ranges receive very less rainfall and are subjected to extremebiotic pressures. The forests in these regions are essentially scrub land. The species found inthese forests are Acacia latronum, Acacia leucophloea and occasionally Arabica Arabica.

41. Byadgi Town is a semi urban area surrounded by land that was converted for agricultural usemany years ago. Hillocks with sparse vegetation are located in the town. There is no protected area, sanctuaries or forest in Byadgi Town or near to the project areas.

C. Socio-economic Conditions

42. **Demography:**Byadgi population has grown from 25,663 in 2001 to 30,600 in 2011 with a growth rate of 19.24 %. The decadal growth was never steady during the past ten decades. The lowest growth rate of 6.65 was observed during 1961-71 and the highest was recorded in the decade 1921-1931with a figure of 40.17 percent. Details of decadal population growth are indicated in the Table 6, below. The population density of Byadgi Town was 4,270 persons per square kilometre in the year 1981 and it increased to 7,286 persons per square kilometre in 2011.

Table 6: Population Growth of Byadgi Town

Year	Population	Decadal Growth Rate
	Nos.	%
1921	5,502	-
1931	7,712	40.17
1941	8,783	13.89
1951	11,625	32.36
1961	13,450	15.70
1971	14,345	6.65
1981	17,935	25.03
1991	20,574	14.71
2001	25,663	24.74

Year	Population	Decadal Growth Rate
	Nos.	%
2011	30,600	19.24

43. **Sex Ratio. T**he current sex ratio (female population per 1,000 male population) in Byadgi is 983, which is higher than the district and state urban average figures of 945 and 940 respectively. The sex ratio is showing an increasing trend from the year 1971 to 2011, which indicates that the female population is growing at a faster rate than the male population.

44. **Literacy**. The literacy rate of the city is 67.0 percent (2011 census).

45. **Industry &Agriculture.**Owing to fertile agricultural lands and favourable climate, Byadgi region is agriculturally rich and is particularly famous for Chilly cultivation. Byadgi has become synonymous with good quality chillies. Byadgi provide all necessary marketing and processing facilities that cater to its vast hinterland cultivating Byadgi Chilly. Besides Chilly, cotton and betel nuts are the other major crops grown in and around Byadgi. The Town has one of the biggest APMC (agricultural produce market committee) market in the state. This market attracts traders from all over Karnataka state and also from the neighbouring states like Andhra Pradesh.

46. Industrial development in Byadgi is mainly limited to Chilly based processing units. There are around 25 industries in and around Byadgi town which are involved in grinding chillies into powder. Besides, Byadgi Chilly is also widely used for the extraction of oleoresin, red oil from the pods, due to its bright red colour. Oleoresin oil is used widely by cosmetics industry. There are also a number of units extracting oil from Chillies. The extraction of oleoresin has also led to the creation of cold storage units in Byadgi since the chilly pods have to be maintained at a low temperature of 4 to 6 degree Celsius in order to maintain the colour and purity. This oleoresin is sent to Kerala where it is further refined before being exported to USA, Japan, Europe, etc.

47. The STP location identified is outside the town towards Teradahalli Village and the current land use is agriculture with cotton growing there. Government land identified for septic tank at Agasanahalli Nagar is currently barren.

48. **Storm Water Drainage.**There is no major watercourse in the town. Key issues associated with storm water drainage in the town comprise: (i) only 18 percent of the road length is covered with drains; (ii) Adverse health impacts on population living in low-lying areas due to unplanned disposal of storm water; and (iii) Disposal of sullage/solid waste into road side/natural drain result in blockage of drains and polluting Tanks.

49. There is no sewer network or sewer treatment system in the town at present. Few houses have individual septic tanks and there are few public toilets. All these are draining to the storm water drain which eventually reaches the water bodies causing further deterioration of the water quality.

50. The effluent from the STP will be directed to the nalla(natural drain) nearby after ensuring its quality standards.

51. The City Development Plan proposes to develop Byadgi's storm water drainage based on: (i) rehabilitation of existing drains; and (ii) laying of new roadside drains.

52. **Transportation.** Key transportation issues in Byadgi TMC – (i) Hogaragali road and Main road exhibit poor surface condition with cracks, potholes, ravelling and soil on the surface; It was observed that street roads are poor in surface condition with the presence of potholes and soil present on the surface; Absence of road side drains; (ii) Soil strata of the town is characterized as sand and BC soil, and the town also has extreme climatic conditions affecting the road construction and maintenance; (iii) There are two junctions and Main road, Hausabhavi road with considerable pedestrian movement, but there is no

footpath. Effective road width is reduced due to pedestrian movement on carriageway causing accidental risk; (iv) Encroachment of sidewalks by street-side vendors; (v) There is no parking regulation;

53. The sewer networks are proposed only along the sides of existing roads. A clear access road is proposed for both STP and Septic Tank site is on the side of the main road, and hence ensured the accessibility to both proposed sites.

D. History, Culture andTourism

54. Byadgi is a Taluka in Haveri District. The town is a moderate urban centre in the District. The history of Byadgi is very old. The surrounding areas of Byadgi produce Chilli (red in colour and long) which is dried in sun light and sent to different markets. This spicy chilli is one of the common ingredients used in Udupi cuisine.

55. Famous holy place KagineleKanakadas Temple is located in the Byadgitaluk and 15 km northeast in direction from Byadgi town. Another holy place KadaramandalagiKantesh Temple is 6 km away from Byadgi. But the present designs of sewer network won't affect any of these structures / properties. The proposed sites for STP and Septic tank are not near to these structures.

56. Largest proportion of population comprises Hindus followed by Muslims and then Christians. Almost all speak in Kannada followed by Hindi.

V. SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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.

58. This IEE evaluates impacts due to the location, design, construction and operation of the project.

i) **Location Impacts**: Includes 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.

ii) **Design Impact**: Includes impacts arising from the subproject design, including technology used, scale of operation / throughput, waste production, discharge specifications, pollution sources and ancillary services.

iii) **Construction Impacts**: Includes impacts caused by site clearing, earthworks, machinery, vehicles and workers. Construction site impacts include erosion, dust, noise, traffic congestion and waste production.

iv) **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. The ADB Rapid Environmental Assessment Checklist (Sewage Treatment) in http://www.adb.org/documents/guidelines/environmental_assessment/eaguidelines002.asp was used to screen the project for environmental impacts and to determine the scope of the IEE investigation.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).

A. Location Impacts

60. **Location.** These Impacts are associated with planning particularly on the site selection. They include impacts due to encroaching on sensitive areas and impacts on the people who might lose their homes or livelihoods due to the development of the proposed site.

61. In case of sewerage components, no significant impacts are anticipated since the laying of sewer line will be on roadROW in the already built up area.The sewer alignments have been carefully selected to avoid encroachment into sensitive areas and minimise the impacts on people livelihoods and homestead. Any potential resettlement impact has been addressed in the subproject resettlement plan.

62. **STP Site**. The STPis not located within or adjacent to any environmentally-sensitive areas. The total land area required is8 acres and the ULB has purchased this land from the owner (documents obtained from the ULB has attached along with this report as **Appendix 6).**The site is away from inhabited areas in the western side about 0.5 km from the TMC boundary. Site is selected based on the gravity flow; and is surrounded by agricultural fields. The treated effluent will be disposed into a natural stream (locally known as Shanbogarnala) which is flowing adjacent to the site. Thisnala presently carries untreated wastewater from the town, and. ultimately joins Hombaradi Lake about 9.5 km further northwest of the site traversing large tracks of agricultural lands. Untreated wastewater from this nala is presently used for irrigation. The stream mostly carries wastewater except during rains, and consequently never reaches the lake. This irrigation use will continue after the construction of STP as well, but with treated effluent that is safe and suitable for irrigation. No significant adverse impacts envisaged due to location of STP at this site.

63. However, considering the future growth of the town, the STP may become closer to the inhabited areas in the near future, and the STP operation may have negative impacts due to bad odours.The SBR being an aerobic process and conducted in a compacted and a closed system with automated operation, the 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 are included in the designs considering future town growth::

(i) A green buffer zone of 10-15 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.

(ii) Further 100 meter around the STP site declared as ‘no development zone’ and informed to Town Planning Department.

64. **Septic Tank Site**. As the Agasanahalli Nagar area (Ward No.23) is located on comparatively a lower ground level with the rest of the city, it has not been found feasible to connect to the main sewer network leading to STP.Therefore, it has to be provided with independent treatment system like Septic Tank. Proposed for septic tank is situated in this area in the periphery of the town. Site is located near the inhabited area of Agasanahalli Nagar, and the nearest house is about 10 m from the site. Site is not located in swampy areas or areas prone to flooding. It is accessible for cleaning. The total land area required for the septic tank is 500 m2 and it is owned by the government (the ownership documents are attached as **Appendix 7).**Septic tank will be constructed below the ground and will be closed, the odour, thereforethe odour nuisance to surrounding areas will be minimal, provided the operation and maintenance is proper. Considering the close location to the nearby houses (~10 m to nearest house), following measures will be included in the project design:

(i) A green buffer zone of 5 m wide around the septic tank; 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 and will also reduce the odour nuisance.

(ii) Implementappropriate operation and maintenance procedure as per the design,training of maintenancestaff, and provision of appropriate maintenanceequipment

(iii) Awareness creation in the septic tank users; do's and don'ts for proper function of septic to avoid any bad odours or overflow

B. Design Impacts

65. These impacts from the design of the subproject including the technology used, scale of operation, throughput, waste production, discharge specification, pollution sources and ancillary services.

66. **Design of the Proposed Components.** The Central Public Health and Environmental Engineering Organization (CPHEEO) manual suggests a design period of 30 years in designing the seweragesystem and its components. However, in order to maintain unanimity in the design period and design population, it is proposed to consider 2046 as the design year for all the subproject components. 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 to estimate the expected sewage generation at the ultimate design period.

67. **Sewer network.** CPHEEO manual requires sewer lines to be laid 1 m. from any water supply line.The sewer pipes will be laid, as far as possible, in straight lines in both vertical and horizontal planes; however, where bends are unavoidable, they would be long radius bend with cleaning eyes. Anything that is likely to cause irregularity of flow would be avoided.At junctions of pipes in manholes, direction of flow from a branch connection should not make an angle exceeding 45 degree with the direction of flow in the main pipe.The sewerage system network has been so planned to eliminate lifting and pumping stations. The limiting depth of excavation for the sewer lines are kept at 6.0 m from the existing ground level..Measures such as the following have beenconsideredin sewer system design to ensure that the system provides the benefits as intended:

(a) Limit the sewer depth where possible

(b) Sewers shall be laid away from water supply lines and drains (at least 1 m, wherever possible);

(c) 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)

(d) In unavoidable, where sewers are to be laid close to storm water drains or canals or natural streams, appropriate pipe material shall be selected (stoneware pipes shall be avoided)

(e) For shallower sewers, use small inspection chambers in lieu of manholes;

(f) Design manhole covers to withstand anticipated loads & ensure that the covers can be readily replace if broken to minimize silt/garbage entry

(g) Ensure sufficient hydraulic capacity to accommodate peak flows & adequate slope in gravity mains to prevent build up of solids and hydrogen sulphide generation

(h) 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

(i) Establish routine 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

(j) Conduct repairs prioritized based on the nature and severity of the problem. Immediate clearing of blockage or repair is warranted where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, or sewer line blockages);

(k) 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;

(l) 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.

(m) 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

(n) Develop an Emergency Response Plan (ERP) for the sewerage system leaks, burst and overflows, etc. A Template for ERP is provided in **Appendix 8.**

68. **Sewage Treatment Plant**: 5 MLD STP will be constructed in Byadgi., and proposed to adopt Sequential Batch Reactor (SBR) based sewage treatment process. Of late this process has become very popular in India for sewage treatment, mainly owing to its treatment efficiency, less land requirement with compact design and mostly automated operation. The proposed SBR process consists of the following stages:

- Inlet works with mechanical screens, grit removal, flow measurement & flow splitter box
- Batch reactors with individual inlet flow control & a fully automated process
- Mechanical sludge dewatering
- Short term (14 days) sludge holding area

69. The STP process is designed to meet the stringentdisposal standards into inland water bodies. The treatment and disposal standards adopted for Byadgi STP are given below.These standards comply with the disposal standards laid by the KSPCB in the CFE issued to Byadgi STP (**Appendix 2**):

	Parameter	Unit	Raw sewage (STP influent)	Treated sewage (STP effluent)
1	pH		5.5 – 9.0	6.5 – 9.0
2	Biochemical Oxygen Demand (BOD5)	mg/l	315	≤ 10
3	Chemical Oxygen Demand (COD)	mg/l	500	≤ 100[4]
4	Total Suspended Solids (TSS)	mg/l	300	≤ 10
5	Total Kjeldahl Nitrogen (TKN as N)	mg/l	45	≤ 5
6	Total Nitrogen (TN as N)	mg/l	-	≤ 10
7	Total Phosphorous (TP as P)	mg/l	5	≤ 2
8	Fecal Coliform	MPN/100 ml	1×10^6	≤ 100
9	Total Coliform	MPN/100 ml	1×10^7	-

70. Treated sewage meeting the above disposal limits will make it suitable for unrestricted irrigation use. The STP site is surrounded by agricultural fields and therefore there is considerable demand for irrigation water. The treated effluent will be discharged into a natural drainage channel passing adjacent to the STP site. This natural channel runs through agricultural fields providing easy access for farmers to use for cultivation. This drainage channel is currently carrying untreated sewage from the town. Therefore the treated water disposal will have positive benefits.

71. The SBR based STP will require uninterrupted power supply for operation of all the activities from STP inlet to treatment (SBR operation) and to sludge dewatering and drying. 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 Byadgi TMC has basic understanding of technical features (design and operation) and regular maintenance.

72. The above issues are be considered in design and operation of STP. Appropriate measures, such as the following, have been integrated into planning and design of the STP.

(i) Continuous uninterrupted power supply should be provided for the facility

(ii) Back-up facility (such as generator) shall be provided and adequate fuel supplies shall be ensured for running of generator when required;

(iii) Provide an 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 DBO contractor should include operation and Maintenance periodofsix years to ensure smooth operation, training to the ULB staff and gradual transfer of facility to the Byadgi TMC.

73. **Sludge Management**. 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. However, there are no industries with problematic wastewater discharges in the catchment area of the proposed wastewater treatment plant. Most importantly, as provided above, no industrial discharges are allowed into municipal sewer system.

74. The sludge from SBR basins will be collected into sludge sump and conveyed to centrifuge unit for dewatering the same. The necessary centrifuge feed pumps & centrifuge

[4] CFE (Appendix 2) issued by KSPCB erroneously show the COD limit as 50 mg/l as the actual limit is 250 mg/l. KSCPB indicated that it will issue a revised CFE; IA will submit an application to KSPCB for this.

will be provided. The sludge in the form of a wet cake from the centrifuge will be collected in tractor trolley directly placed below the centrifuge room, and transported to the municipal solid waste compost plant in Byadgi. This sludge will be further dried and blended with the other compost and will be sold in the market for use as soil conditioner in agriculture.

75. 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. 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, -The specification are given in **Table 7**:

Table 7: Dried 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

76. **Septic tank.**The design of a septic tankdepends on the number of users, the amount of water used per capita, the average annual temperature, thedesludgingfrequency and the characteristics of thewastewater. As per IS 2470 (Indian Standards), the septic tank capacity is calculated as: 275 number of users, at the rate of108 lpcd (@ water supply 135 lpcd), and therefore sewage generation 0.03 ML, anddesludging frequency once in a year. The septic tank will have at least 2 chambers made of concrete. The first chamber will be at least 50% of the total length, and when there are only two chambers, it will be two thirds of the total length.The gases produced duringanaerobicdigestionmust be allowed to escape through a screened vent pipe to control release of odorous and potentially harmful gases. Surface and subsoil water should not find way into the septic tank.

77. After treatment in the septic tank, the treated effluent will be passed through a gravity filter and then it is proposed to be discharge into the nearby nallah (Shanbogarnallah), which flows through the town, and flows adjacent to the proposed STP site. This nallah presently carries wastewater from the town.No impacts envisaged due to disposal of treated sewage from the septic tank. Following are the characteristics of raw and treated wastewater of the septic tank.As the design of septic tank is not yet initiated, no details on the raw and/or treated sewage is not available. However it will be ensured that adequate treatment is ensured in septic tank and then passing through the gravity filter so that there is no negative effect on the environment or public health.

78. The accumulated septage / sludge from the septic tank will be collected once a year using mobile sucker tankers, transported and discharged into the wet well in the STP complex. It is proposed to empty the sludge into wet well over a period of 12 hours for dilution. In the wet well it will mix with the raw sewage, and will be treated in the STP. The

estimated quantity of septage/sludge generated from the septic tank is 210 Kg per year (as per CPHEEO norms)

79. Under no circumstances should effluent from the septic tank be allowed into an open channel drain or body of water without adequate treatmentIt is essential that the floor of the tank be water tight and of adequate strength to resist earth movement and to support the weight of the tank,walls and contents.Spreading of sludge on the ground in the vicinity should not be allowed. These are all included in the design. The groundwater in the town is also deep (>10 m). No impacts therefore envisaged due to septic tank. However, proper operation and maintenance, periodic removal of septage are crucial for smooth functioning of the system, and also to avoid nuisance due to bad odours and overflowing of septictank directly into the drains.

(i) Implement appropriate operation and maintenance procedure as per the design, training of maintenance staff, and provision of appropriate maintenance equipment

80. **Utilities.** During the installation stage of underground sewer lines the utilities like telephone lines, electric poles and wires, water lines on sewer network alignment may be shifted resulting to temporary disruption of services. To mitigate the impacts due to relocation of the utilities, DBOContractorwillidentify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase.

81. The ULB has to obtain necessary clearances and permissions, except the labour license. The DBO contractor has to obtain the labour license and ensure that other necessary clearances are obtained before starting the work. The applicable clearances and responsibilities are given as **Appendix 9.**

82. **Site selection of construction work camps, stockpile areas, storage areas, and disposal areas**. Priority is to locate these near the subproject locations. However, if it is deemed necessary to locate elsewhere, sites to be considered will not result in destruction of property, vegetation, irrigation, and drinking water supply systems. Residential areas will not be considered for setting up 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 the forest, water bodies, swamps, or in areas which will inconvenience the community. All locations would be included in the design specifications and on plan drawings. Construction work camps shall be located at least 200 m from residential areas. Material stockpiles shall be protected by bunds during the monsoon to arrest the silt laden runoff into drains. The subproject is likely to generate soil from excavations, which needs to be disposed safely. The following measures should be considered for disposal of surplus/waste soil:

(a) The excavated soil should be removed from construction area at the earliest for beneficial reuse such as land raising / filling of excavated areas.

(b) Soil should be covered with tarpaulin sheets during the transportation.

(c) Soil transportation should not be done during the peak hours and should be avoid narrow and heavy traffic routes and important religious or tourist sites.

83. **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 included in the design specifications and on plan drawings. Priority would be sites already permitted by Mines and Geology Department. If other sites are necessary, these would to be located away from population centers, drinking water intakes

and streams, cultivable lands, and natural drainage systems; and in structurally stable areas even if some distance from construction activities.

84. For Byadgi subproject, the quarry material required will be sand and stone aggregate, and the nearest quarries are near Harihar and Medleri (sand quarries along River Tunga bhadra) and Chatra at Motebennur and Hunagamatte in RanebennurTaluka for stone aggregate. These are existing quarries and are licensed by Mines and Geology Department. The material from the existing quarries will be adequate for the subproject construction, and therefore no new quarry sites will be developed for the purpose.

85. **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 archaeological and historical remains. Nevertheless, CSS shall :

(a) Consult Byadgi Town Municipal Council to obtain an expert assessment of the archaeological potential of the site;

(b) Consider alternatives if the site is found to be of high risk;

(c) 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

(d) DBO Contractor have to develop a protocol for use in conducting any excavation work, to ensure that any chance finds are recognised and measures are taken to ensure they are protected and conserved. This protocol have to be approved by the PIU.

86. The Septic Tank should be designed strictly as per BIS 2470. The septic tank design should ensure there is no leak of seepage from the septic tank in to the groundwater or to the water bodies nearby.

C. Construction Impacts

i. Construction Method

87. The civil works for sewer network projects include earth work excavation for pipeline trenches, pipe laying, installing valves, shifting of public utilities (if required) and providing house connections. Earth work excavation will be undertaken by machine and include danger lighting and using sight rails and boning rods at every 100 m., while pipe laying works will include laying pipes at required gradient, fixing collars, elbows, tees, bends and other fittings including conveying the material to work spot and testing for water tightness.

88. 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. 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.Following table (

89. **Table** 8) shows the details of construction activities involved in the subproject.

Table 8: Construction Activities for the Subproject

Component	Construction method	Likely waste generated
Sewer lines	Trench excavation along the identified main roads of about 0.4-1 m wide and 1.5- 4 m deep, but in some case it may go upto 6 m deep. Trench will be excavated using backhoe and where not feasible will be done manually. Excavated soil will be placed	About 86% of excavated soil will be utilized for refill; remaining soil need to be disposed off.

Component	Construction method	Likely waste generated
	along the trench. A bed of sand of 100 mm thick will be prepared at the bottom and pipes will be placed and joined. Excavated soil will be replaced and compacted. Where the pipes are laid in the roadway, handheld pneumatic drill will be used to break the road surface. Construction activity will be conducted along the roads in the town and will cover most part of the town. The work will be conducted by a team of 5 workers at each site	
Sewerage Treatment plant (STP)	This will include constructionwet well, SBR basinetc.	This activity will not generate any excess/ surplus soil that need to be disposed; the excavated soil will be used to raise the ground level of the site
Septic Tank	Septic tank required excavation of the soil, and construction of cement concrete tank	Some part of the soil will be used for the side and bottom stabilization and remaining for landscaping around the excavation site. Therefore, this activity will not create any excess / surplus soil.

90. As detailed above, except linear components like sewers, construction activities of all other components are minor and will be confined to selected isolated sites (already in use or new). However, the material and waste transport to and from the site will use public roads.

91. Although construction of the pipelines and sewers involve quite simple techniques of civil work, the invasive nature of excavation and the subproject locations in the built-up areas of Byadgi Town, where there are a variety of human activities, will result to 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.

92. 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 construction practices. These are discussed in detail in the following sections.

93. While trenching at densely populated areas like market place or layouts, roads with heavy traffics additional care has to be taken. Hard barricade should be mandatorily provided along with caution board and traffic diversion boards. Some of the densely populated areas identified at Byadgi are Nehru Nagar, Chowdeshwari Nagar, Byadgi Market etc. and major road with heavy traffic are State Highway, Bus stand road and Bye-pass road. Except these three road, all other roads are narrow and/or located in busy commercial area. Therefore, full closure will be required in those stretches.

94. Prior to starting of work, the DBO contractor should prepare Construction Management Plan. The Construction Management Plan should be site specific and has to submit every month before starting the work. The Construction Management Plan will include the method statement for construction works, Utility Management and Contingency Plan, Traffic Management Plan, Work camp and Labour Camp details, Safety measures taken for the workers and the public. etc.

95. The method statement for pipeline and sewer works should be simple and explain the contractor's work process that is actually conducted on site, with safety and safeguard concerns. Method Statement is very important, particularly for sewer works along the roads. Method Statement can be prepared for each stretch (say 1 km) /specific site based on the

project area. Method Statement should be in a Table format with appended site layout map and cover the following:

- Work description
- No. Of workers (skilled & unskilled)
- Details of Plant, equipment & machinery, vehicles
- Work duration (total, and activity-wise, for example for pipe laying, from excavation to road resurfacing/testing)
- PPE (helmet, gloves, boots, etc) details for each type of work
- Details of materials at each site (type & quantity)
- Risks/hazards associated with the work (for example, Trench excavation will have risks such as trench collapse, persons/vehicles falling into trench, structural risk to nearby buildings, damage to buildings, infrastructure etc)
- Construction waste/debris generated (details & quantity)
- Detail the sequence of work process (step-by-step) including specific details of each work
- Contractor's supervision & management arrangements for the work
- Emergency: Designate (i) responsible person on site, and (ii) first aider
- Typical site layout plan including pipe trenching, placement of material, excavated earth, barricading etc
- The pipeline/sewers are to be laid along the roads. The excavated soil, placed along the trench may get disturbed due to wind, rain water and the movement of workers, vehicles and pedestrians, and spill onto road way – disturbing road users, creating dust, road safety issues, etc, and also into nearby open drains. The following should be included in the site layout plan:
    - Provide barricading/security personnel at the site to prevent entry/trespassing of pedestrian/vehicles into the work zone
    - Location of temporary stockpiles and provision of bunds
    - Separation of stockpiles areas with workers/vehicle movement paths to avoid disturbing the stockpiled soil
    - Wetting of soil to arrest dust generation by sprinkling water
- Waste/surplus soil and concrete debris utilization and disposal plan – indicate expected duration of temporary stockpiling along the trench at each site and identify final surplus soil utilization/disposal site in consultation with PIU

ii. Impact on Physical Resources

96. **Topography, Soils & Geology**. Subproject activities are not large enough to affect these features; so there will be no impacts.

97. **Sources of Materials**. Significant amount of gravel, sand and aggregate, will be required for this subproject. The DBO contractor will be required to:

(a) Use quarry sites and sources permitted by Mines & Geology Department only

(b) No new quarry sites shall be developed for the subproject

(c) Verify suitability of all material sources and obtain approval of implementing agency

(d) Submit on a monthly basis documentation of sources of materials to Construction Supervision Specialist.

98. **Air Quality**. It is most certain that work will be conducted during the dry season, so there is potential for creating dust from the excavation of dry soil, backfilling, transportation to disposal, and from the import and storage of sand/gravel for bedding. Emissions from construction vehicles, equipment, and machinery used for excavation and construction will also 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, Sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons) but temporary and during construction activities only. To mitigate the impacts, DBO contractors will be required to:

(a) Consult with PIU on the designated areas for stockpiling of clay, soils, gravel, and other construction materials;

(b) Damp down exposed soil and any stockpiled on site by spraying with water when necessary during dry weather;

(c) Bring materials (aggregates, sand, etc gravel) as and when required;

(d) Use tarpaulins to cover sand and other loose material when transported by vehicles;

(e) Clean wheels and undercarriage of vehicles prior to leaving construction site

(f) Fit all heavy equipment and machinery with air pollution control devices which are operating correctly; ensure valid Pollution Under Control (PUC) Certificates for all vehicles and equipment used in the construction activity.

99. **Noise Levels.** The soils are deep in the subproject area and therefore activities like rock cutting/blasting that generate high noise are not anticipated. In isolated areas where a hard stratum is encountered (especially for deep sewers in some locations going more than 3 m deep) requiring using of pneumatic drills, there will be high noise during the activity. Also, where the pipelines are required to be laid in the roadway, pneumatic drills will be used to break open the road surface. Pneumatic drills typically generate an equitant noise of 82-98 dB, at 1 m distance from the activity. Increase in noise level may be caused by excavation equipment, and the transportation of equipment, materials, and people. The sensitive receptors are the general population and socio-cultural institutions (schools, colleges, hospitals, religious places, courts etc) in the area. Noise will be for a short term (about 2-3 days at each location) thus impact is minimal and short-term. The DBO contractor will be required to:

(a) Plan activities in consultation with the PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;

(b) Construction work shall be limited to day light hours (6 AM to 6 PM)

(c) Provide prior information to the local public about the work schedule;

(d) Ensure that there are no old and sensitive buildings that may come under risk due to the use of pneumatic drills; if there is risk, cut the rocks manually by chiselling;

(e) Minimize noise from construction equipment/pneumatic drills by using silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and

(f) Maintain maximum sound levels not exceeding 80 decibels (dB) when measured at a distance of 10 m or more from the vehicle/s.

(g) Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach;

(h) Notify the concerned institutions (schools, colleges, hospitals etc) 2 weeks prior to the work, conduct 30 minute awareness programme on nature of the work, likely disturbances and risks, entry restrictions, dos and don'ts etc.

100. **Surface Water Quality.** Byadgi topography is primarily plain; the town receives moderate rainfall. The south – west monsoon winds brings rainfall from June to September while the north – east monsoon winds delivers further rainfall from October to December. Due to these reasons and also that excavation will not certainly be conducted during rains, there is no impact on drainage and surface water quality is envisaged. In unavoidable case of excavation during monsoons, there may be temporary impacts like flooding of construction sites, mixing of construction waste and material within the runoff, etc. This may lead to silting and blockage of drains and water bodies. Mobilization of settled silt materials, run-off from stockpiled materials, and chemical contamination from fuels and lubricants during construction works can contaminate downstream surface water quality of the streams draining the city.

101. These potential impacts are temporary and short-term duration only and to ensure these are mitigated, DBO contractor will be required to:

(a) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets

(b) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with Implementing Agency on designated disposal areas

(c) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies

(d) Provide temporary bunds for stockpiles and materials

(e) Place storage areas for fuels and lubricants away from any drainage leading to water bodies

(f) Dispose any wastes generated by construction activities in designated sites.

(g) Conduct surface quality inspection according to the EMP.

102. **Groundwater**. Subproject activities do not interfere with groundwater regime, no groundwater abstraction proposed nor do the activities affect groundwater quality. As per the studies by the CGWB, the maximum ground water level in this area is 5 -10 m (in post monsoon season) and hence there is no chance any contamination of ground water by the Septic Tank. Further the design is as per IS 2470 (Part -1), to avoid any seepage and leakage.

103. 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. To ensure that water will not pond in pits and voids near project location, the DBO contractor will be required to conduct excavation works on non-monsoon season to the maximum extent possible.

104. **Landscape and Aesthetics**. The construction work is likely to generate considerable quantities of waste soil. The pipe laying work will generate surplus soil; as small diameter pipes/sewers are proposed it will generate only 5-10% as surplus as most of the soil will be used for refilling after the pipe is laid in trench. Indiscriminate disposal of the soil and waste, excess construction material, concrete, packing materials, containers, lubricants and oils may affect the local environment at the disposal location. These impacts are negative but short-term and reversible by mitigation measures. The DBO contractor will be required to:

(a) Prepare and implement Waste / Spoil Management Plan – it should present how the surplus waste generated will temporarily stocked at the site, transported and disposed properly.

(b) Avoid stockpiling of excess excavated soils as far as possible

(c) Avoid disposal of any debris and waste soils in the forest areas and in or near water bodies/rivers;

(d) Coordinate with ULB/TMC for beneficial uses of excess excavated soils or immediately dispose to designated areas;

(e) Recover used oil and lubricants and reuse or remove from the sites;

(f) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;

(g) Remove all wreckage, rubbish, or temporary structures which are no longer required; and

(h) Request PIU/CSS to report in writing that the necessary environmental restoration works has been adequately performed before acceptance of work.

iii. Impact on Ecological Resources

105. Subproject sites are located within the town area. There is no natural habitat left in these sites, and therefore no impacts on ecological resources envisaged.

iv. Impact on Economic Development

106. **Land Use**. Subproject activities will not affect the land use. All subproject activities are being conducted in the vacant space along the road ways.

107. **Accessibility**. Transport infrastructure will be affected by the sewer laying work, as in the narrower streets there is not enough space for excavated soil to be piled off the road. The road itself may also be excavated in places where there is no available land to locate pipes alongside. Traffic will therefore be disrupted, and in some very narrow streets the whole road may need to be closed for short periods. Potential impact is negative but short term and reversible by mitigation measures. The DBO contractor will be required to:

(a) Plan pipeline work in consultation with the traffic police

(b) Plan work such that trench excavation, pipe laying, and refilling including compacting, at a stretch is completed in a minimum possible time;

(c) Provide for immediate consolidation of backfilling material to desired compaction – this will allow immediate road restoration and therefore will minimise disturbance to the traffic movement;

(d) Schedule transport and hauling activities during non-peak hours;

(e) Do not close the road completely, allow traffic to move on one line;

(f) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;

(g) In unavoidable circumstances of road closure, provide alternative routes, and ensure that public is informed about such traffic diversions;

(h) At all work sites public information/caution boards shall be provided – information shall inter-alia include: project name, cost and schedule; executing agency and contractor details; nature and schedule of work at that road/locality; traffic diversion details, if any; entry restriction information; competent official's name and contact for public complaints.

(i) Keep the site free from all unnecessary obstructions;

(j) Drive vehicles in a considerate manner;

(k) Prepare Traffic Management Plan–a template is provided for reference at**Appendix 10.**

108. The following mitigation measures shall be adopted to avoid and/or reduce the temporary impacts to businesses during the project implementation

(a) Provision of advance notice to community to shift their merchandise, vending items, mobile shops at least 7 days prior to construction work;

(b) Conducting awareness campaigns through a media partner, if any and the project resettlement & monitoring NGO with signage for road diversion, safety caution, etc;

(c) Maintaining access to shops by providing planks and leaving spaces to avoid disturbance to residents and businesses;

(d) Open pits to be guarded properly against safety hazard, especially during day time working period, near road crossings, near schools, etc;

(e) Managing traffic flows as per the traffic management plan prepared by the contractor in coordination with local authorities and communities;

(f) Conducting major portion of the works at night, if possible, to avoid / reduce the inconvenience to public and shopkeepers.

(g) Closing the open trenches immediately after pipe laying;

(h) Completing works quickly where large numbers of businesses are located;

(i) Avoiding full road closure to the extent possible;

(j) Placing telephone number on visible areas to notify in case of emergency;

(k) Making the community fully aware of the grievance redress mechanism;

(l) Providing contact number of responsible persons in the PMU and ULB offices,

(m) Providing assistance to vendors and hawkers in shifting to alternative nearby locations and help reinstallation of their business as early as possible

v. Impact on Socio Cultural Resources

109. **Impacts on social sensitive areas.** Since the work is being conducted in an urban area, sensitive areas like schools, hospitals and religious centre, the excavation of trenches and pipe/sewer laying activity will create nuisance and health hazard to children and people with ailments. The measures suggested under various heads in this section will minimize the impact in general in all areas; however, special attention is necessary at these locations. Following measures shall be implemented in 250 m around the sensitive locations (schools, hospitals, and religious centres:

(a) No material should be stocked in this area; material shall be brought to the site as and when required

(b) Conduct work manually with small group of workers and less noise; minimize use of equipment and vehicles

(c) No work should be conducted near the religious places during religious congregations

(d) Material transport to the site should be arranged considering school timings; material should be in place before school starts;

(e) Notify concerned schools, hospitals etc, 2 weeks prior to the work; conduct a 30 minute awareness program on nature of work, likely disturbances and risks and construction work, mitigation measures in place, entry restrictions and dos and don'ts

(f) Implement all measures suggested elsewhere in this report – dust and noise control, public safety, traffic management, strictly at the sites.

110. **Socio-Economic – Income.**The most of the project components will be located in government land. Excavation of trenches and sewer laying work in the town will obstruct access to residences/commercial buildings adjacent to the pipeline. Disruption of access to commercial establishments may affect livelihood. Since many of the roads are narrow, construction activities may also obstruct traffic. The potential impacts are negative and moderate but short-term and temporary. The DBO contractor will be required to:

(a) Leave space for access between mounds of excavated soil

(b) Provide wooden planks/footbridges for pedestrians and metal sheets for vehicles to allow access across trenches to premises where required

(c) Consult affected businesspeople to inform them in advance when work will occur

(d) Address livelihood issues, if any; implement the Resettlement Plan (RP) to address these issues

(e) Provide sign/caution/warning boards at work site indicating work schedule and traffic information; prevent public entry into work sites through barricading and security; and

(f) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.

(g) Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools;

(h) Prepare and implement spoils management plan

(i) Provide alternate sources of clean water until water supply is restored.

111. **Socio-Economic – Employment**. Manpower will be required during the 24-months construction stage. This can result to generation of contractual employment and increase in local revenue. Thus potential impact is positive and long-term. The DBO contractor will be required to:

(a) Employ at least 50% of the labour force, or to the maximum extent, local persons if manpower is available; and

(b) Secure construction materials from local market.

112. **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 DBO contractor will be required to:

(a) Comply with all national, state and local core labor laws (See Appendix 4 of this IEE);

(b) Develop and implement site-specific Health and Safety (H and 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) H

and S Training[5] for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;

(c) All trenches deeper than 2 m shall be protected with hard barricade to avoid safety risks to workers, public and nearby buildings/structures

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

(e) Provide medical insurance coverage for workers;

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

(g) Provide supplies of potable drinking water;

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

(i) 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;

(j) 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;

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

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

(m) 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

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

(o) Overall, the contractor should comply with IFC EHS Guidelines on Occupational Health and Safety (this can be downloaded fromhttp://www1.ifc.org/wps/wcm/connect/9aef2880488559a983acd36a6515bb18/2%2Boccupational%2Bhealth%2Band%2Bsafety.pdf?MOD=AJPERES).

113. **Community Health and Safety**. Hazards posed to the public, specifically in high-pedestrian areas may include traffic accidents and vehicle collision with pedestrians. In most of the cases location of project sites are along the road ways, hence safety risk to community is to be considered. The sewer line work may require deep trenches including in narrow streets; unprotected trench excavation may endanger the stability of nearby

[5]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 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.

buildings/structures. Potential impact is negative but short-term and reversible by mitigation measures. The DBO contractor will be required to:

(a) Provide hard barricading for all deep excavations that may require especially for sewer lines (> 2m); identify buildings at risk prior to start of excavation work and take necessary precautions for safe conduct of work

(b) Plan material and waste routes to avoid times of peak-pedestrian activities

(c) Liaise with IA/Byadgi TMC/CSS in identifying risk areas on route cards/maps

(d) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure

(e) Provide road signs and flag persons to warn of dangerous conditions, for all work sites along the roads

(f) Overall, the contractor should comply with IFC EHS Guidelines Community Health and Safety (this can be downloaded fromhttp://www1.ifc.org/wps/wcm/connect/dd673400488559ae83c4d36a6515bb18/3%2Bcommunity%2Bhealth%2Band%2Bsafety.pdf?MOD=AJPERES)

114. **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. Provision of proper living facilities and basic amenities (water, sanitation, fire safety, health and safety, etc) shall be ensured.

115. The DBO contractor will be required to comply with the following. Overall, the contract should follow the IFC EHS guidelines specific to workers accommodation (this can be downloaded fromhttp://www1.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/publications/publications_gpn_workersaccommodation.

(a) Consult with PIU before locating workers camps/sheds, and construction plants; as far as possible located within reasonable distance of work site

(b) Minimize removal of vegetation and disallow cutting of trees

(c) Living facilities shall be built with adequate materials, and should be in good condition and free from rubbish and other refuge

(d) The camp site should be adequately drained to avoid the accumulation of stagnant water

(e) Provide water and sanitation facilities; water, meeting Indian drinking water standards shall be provided, in adequate quantities (supply of 60- 80 LPCD); all water storage structures must be cleaned regularly and covered properly to avoid any contamination

(f) Provide separate facilities for men and women; sanitary facilities shall be properly build and well maintained; toilet and bath facilities should be provided on basis of 1 per 15 or less persons

(g) Train employees in the storage and handling of materials which can potentially cause soil contamination;

(h) Recover used oil and lubricants and reuse or remove from the site;

(i) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;

(j) Remove all wreckage, rubbish, or temporary structures which are no longer required; and

(k) Report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.

(l) The work camp details should be included in the Construction Management Plan.

116. **Social and Cultural Resources – Chance Finds**. Subproject area is not a potential archaeological area and therefore no impacts envisaged.Nevertheless, the DBO contractor will be required to:

(a) Strictly follow the protocol for chance finds in any excavation work;

(b) Request PIU/CSS or any authorized person with archaeological/historical field training to observe excavation;

(c) Stop work immediately to allow further investigation if any finds are suspected; and

(d) Inform PIU/CSS if a find is suspected, and take any action they require ensuring its removal or protection in situ.

(e) Adjacent to historic sites, undertake excavation and construction work in such a way that no structural damage is caused to the building.

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

(a) The said 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.

(b) Debris disposal site shall be at least 200 m away from surface water bodies6.

(c) No residential areas shall be located within 100 m downwind side of the site.

(d) The site is minimum 250 m away from sensitive locations like settlements, ponds/lakes or other water bodies.

(e) The local governing body and community shall be consulted while selecting the site.

D. Operational & Maintenance Impacts

118. **Sewer System.**The new sewerage system will need regular maintenance during operation; with a few simple precautions this can also be conducted without major environmental impacts.

119. The new sewerage system provided under the Investment Program will collect domestic wastewater and sewage produced by the town population. The proposed treatment plant will treat the sewage andthe discharge after treatment will comply with Indian wastewater disposal standards.

120. The sewer pipes will not function without maintenance, as silt inevitably collects in areas of low flow over time. The project will therefore provide equipment for cleaning the sewers, including buckets and winches to remove silt via the inspection manholes, diesel-fuelled pumps to remove blockages, etc. Piped sewers are not 100% watertight and leaks can occur at joints. The measures suggested for consideration during the design of sewer

[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 PMDCSC.

network will help in proper functioning of the system. Any repairs will be conducted by sealing off the affected sewer and pumping the contents into tankers, after which the faulty section will be exposed and repaired following the same basic procedure as when the sewer was built. Trenches will be dug around the faulty section and the leaking joint will be re-sealed, or the pipe will be removed and replaced.

121. **Operation of STP**. STP operation will be mostly automated with less human intervention in the process, so scope for human error and its effect on efficiency is very limited. Design also includes provision for automated shutdown in the incidence of high BOD (above design capacity) entering the plant. However, it must be ensured that the facility is operated with standard operating procedures and only by trained staff. Ensuring uninterrupted power supply with back-up facility is a must.

122. Potential health hazards due to improper sludge disposal methods. Sludge will be regularly accumulated in the basins during each process batch. This sludge from basins will be collected into sludge sump and conveyed to centrifuge unit for dewatering and thickening. 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. Personal Protection Equipment shall be provided.

123. The impact due to odour nuisance may be considered as lowsince the proposed STP is based on compact and efficient SBR process will ease the biodegradation process within treatment units and thereby reduce odour problems and also the proposed green buffer zone around the site will reduce the impact on nearest habitations. Green buffer zone in the form of landscaping and earthwork shall be created and well maintained around the site. No development zone will be declared as per the instructions from KSPCB. O&M of STP will be conducted regularly to reduce odour problems to the neighbors.

124. However, STP operation It is suggested to develop an Emergency Response Plan (ERP) in case of release of bad odours from the facility. A Template for ERP is provided in **Appendix 8**. Sensitize and train staff in implementation of ERP.

125. **Impacts of STP effluent.**The effluent from the STP will be drained to the nalla near to the proposed project site. The effluent should be released only after treatment at STP plant. The quality of the effluent should be checked periodically and ensure it complies the CPCB/KSPCB norms (Given in **Appendix 11**)

126. **Operation of Septic Tank.** The septic tank should be emptied to the STP using a tanker fitted with sucking and jetting machine. This is recommended to emptying the Septic tank once in a year. Failure or delay will cause health issues to the people inhabiting in that area in addition to blocking of the sewer lines and bad odour.

127. In order to maintain the functions of Septic Tank, the users should i) not use any chemicals (e.g. acid and alkaline agents) or non-biodegradable materials which may have an adverse effect on the functioning of the septic tank; ii) Keep the tank and its surrounding area neat and clean, iii) Never mix oil with discharged water which will upset the digesting function of the septic tank and generate scum and foul odour. If it is unavoidable, install a gravity baffle chamber for use as an oil-water separator in the upstream of the septic tank. Following measures will be implemented:

(a) Implement appropriate operation and maintenance procedure as per the design, training of maintenance staff, and provision of appropriate maintenance equipment

(b) Create awarenessamong the users about the septic tank function, do’s and don’ts to ensure proper function of the system and also about the negative impacts if the system malfunctions.

128. As per the CGWB studies, the ground water level in Byadgi during the post monsoon period is 5-10 meters below ground level and that during the pre-monsoon period is 10-20 meters. Hence the chance of groundwater contamination is rare.

129. The design of the septic tank cover is ensured with safety and robustness, PVC encapsulated rungs have been provided in side right below the manhole opening for easy access for cleaning and desludging. The top slab is strong enough to withstand any casual load above it.

130. The chance of any vehicle parking over the septic tank is remote as the top of the slab will be about 30 cm above the ground surface, nevertheless the contractor have to put warning board at the site. Adequate fencing should be provided around the septic tank site.

131. **Surface Water Quality:** The ULB will be required to restrict any discharge of raw sewer to the drains prior to commissioning of the sewer network

132. **Occupational Health and Safety:** There are no source of hazardous material that will discharge hazardous materials into the sewers, resulting in damage to sewer system and danger to workers. Waste water, other than municipal (i.e., industrial) entering the sewerage system shall meet the stipulated standards.

133. The DBO Contractor needs to prepare Operation and Maintenance (O&M) Manual and operate and maintain the system as per the manual (A draft of the O&M plan is given in **Appendix 12**). Preparation of O&M Manual may be included in the scope of DBO Contractor. Measures to minimize the disturbance to general public/ business and dust control, as followed during the construction, is to be implemented during maintenance as well. Operation of sewage pumping station will be simple, but requires skilled workforce.

E. Cumulative Impact Assessment

134. The cumulative impact assessment (CIA) examined the interaction between the subproject's residual effects (i.e., those effects that remain after mitigation measures have been applied) and those associated with other past, existing and reasonably foreseeable future projects or activities. The interaction of residual effects associated with multiple projects and / or activities can result in cumulative impacts, both positive and negative. The subproject's potential cumulative effects were considered with respect to Valued Components (VCs) in the categories of environmental, socio-economic, and heritage resources in four areas:

(i) Of any potential residual project effects that may occur incrementally over time;

(ii) Consideration of other known relevant projects or activities within the specified study area boundaries, even if not directly related to the subproject;

(iii) Potential overlapping impacts that may occur due to other developments, even if not directly related to the proposed project; and

(iv) Future developments that is reasonably foreseeable and sufficiently certain to proceed.

135. In addition, the CIA considered the scope or influence of the subproject. Two boundaries, spatial and temporal,7 were used.

136. The subproject EIA has identified the VCs as air quality, noise, geophysical (hydro geological), traffic management, socio-economic and socio-community, and human health. Other foreseeable projects that will overlap with the subproject are the construction of the other water supply subproject components, in particular rehabilitation and expansion of the water distribution system (namely storage, transmission, and primary distribution networks).

[7]Spatial boundary refers to the area immediately surrounding the alignment; while the temporal area considers the potential cumulative effects associated with subproject construction, and operation and maintenance, and those associated with other past, existing and reasonably foreseeable projects in the vicinity of the subproject.

The spatial boundary of the subproject is the area along the alignment and the existing ROWs. The temporal boundary can be considered as the whole Byadgi TMC limits.

137. Noise levels in the immediate proximity of most work sites are expected to increase during construction. The duration of this exposure will be relatively brief. This exposure represents temporary, localized, adverse residual effect of low to moderate significance for affected receptors. While building damage due to ground vibrations is unlikely, there may be annoyance to spatially located receptors during construction.

138. Air quality effects will occur during construction. Consequently, although emissions of Common Air Contaminants (CAC) and fugitive dust may be elevated in proximity to active work sites, this impact will be short-term and localized to the immediate vicinity of the alignment. Greenhouse Gas (GHG) emissions may increase as a result of project construction activities (i.e., vehicle and equipment operation, concrete production, disposal of excavated material). Given the subproject's relatively minor contribution to CAC and GHG emissions during construction, the overall significance rating of both these potential residual effects is considered to be negligible.

139. Land use/traffic management concerns will occur spatially during construction. During construction, site-specific mitigation measures will be implemented to address temporary disruptions to land use and access in the vicinity of the alignment such as road and sidewalk closures, traffic delays and detours, parking modifications, and increased volumes of construction–related traffic. There should be improved traffic movement along the alignment once construction is completed. Since the subproject will be built along existing road corridors, it will not conflict with existing or planned land use.

140. Adverse impacts such as localized disruption of vehicle traffic, parking, cycling and pedestrian movements and public transit bus service in areas along the alignment, and elevated CAC and fugitive dust emissions in proximity to work sites, elevated noise and vibration levels and visual impacts will occur during construction. These short-term effects will be mitigated by providing alternate travel routes or alternating traffic movements and, where possible, access to businesses, schools and residences. However, upon completion of construction the socio-community will benefit from health condition due to operational sewage network. This is considered a long-term cumulative benefit.

141. No adverse residual effects to human health will occur as a result of project construction or operation. While exposure to elevated noise levels and fugitive dust and CAC emissions will occur in proximity to subproject work sites during construction, due to their short-term, localized nature, these effects are expected to be minor and insignificant with no measurable effects on human health. The subproject operations will benefit the general public by contributing to the long-term improvement of quality of water bodies and overall health of the people.

142. The provision of an improved sewerage system is expected to have indirect economic benefits from the expected improvement in the health, environment and economic well-being.

143. The citizens of the Byadgi Town will be the major beneficiaries of this subproject. The sewerage system will remove the human waste from those areas served by the network rapidly and treated to an 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 (such as diarrhoea and dysentery) will be reduced, so people should spend less on healthcare and lose fewer working days due to illness, and hence their economic status should also improve.

VI. PUBLIC CONSULTATION & INFORMATION DISCLOSURE

A. Project Stakeholders

144. 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 are:

(a) Residents, shopkeepers and businesspeople near the work sites;

(b) Public representatives and prominent citizens of the town

(c) Byadgi Town Municipal Council

(d) KUIDFC, GoK

145. Secondary stakeholders are:

(a) Other concerned government institutions (utilities, regulators, etc)

(b) NGOs and CBOs working in the affected communities;

(c) Other community representatives (prominent citizens, religious leaders, elders, women's groups);

(d) The beneficiary community in general; and

(e) ADB as the funding agency

B. Consultation & Disclosure Till Date

146. A series of public consultation meetings were conducted during the project preparation. Various forms of public consultations (consultation through ad hoc discussions on site) have been used to discuss the project and involve the community in planning the project and mitigation measures.

147. Besides, a public consultation workshop was conducted at Davangere for all the four project towns to discuss the proposed project and likely environmental issues and mitigation measures. Key stakeholders – public representatives, officials from various agencies, district level officers, from each project town, including Byadgi, were participated in the workshop.

148. The pubic, in general, was in support of the proposed infrastructure developments. One major concern raised by the public was the Operation and Maintenance of the sewer lines and treatment units. They also request to inform the work schedule and possible full or partial closure of the roads, in advance. Minutes of this consultation meeting is appended at **Appendix 13**.

149. The DBO contractor will be developing an Operation and Maintenance plan for the STP and Septic Tank and the Byadgi TMC will monitor its implementation. Narrow and busy roads along the proposed alignments have already been identified in this IEE and a detailed Traffic Management Plan is given along with this IEE to facilitate traffic management.

C. Future Consultation & Disclosure

150. EA and IA shall extend and expand the consultation and disclosure process significantly during implementation of the Investment Program. These disclosures will be informal in nature and will be conducted along the project stretch where the work is progressing. The DBO contractor will organize these disclosure meetings and will be attended by the representatives of the PIU and TMC.

(i) Consultation during construction:

- Public meetings with affected communities (if any) to discuss and plan work programmes and allow issues to be raised and addressed once construction has started; and

- Smaller-scale meetings to discuss and plan construction work with individual communities to reduce disturbance and other impacts, and provide a mechanism through which stakeholders can participate in subproject monitoring and evaluation;

(ii) Project disclosure:

- Public information campaigns (via newspaper, TV and radio) to explain the project to the wider town population and prepare them for disruption they may experience once the construction programme is underway;

- Public disclosure meetings at key project stages to inform the public of progress and future plans, and to provide copies of summary documents in Kannada; and

- Formal disclosure of completed project reports by making copies available at convenient locations in the study towns, informing the public of their availability, and providing a mechanism through which comments can be made.

151. Based on ADB requirements, the IEE report prepared and approved by ADB during feasibility stage had beenposted on ADB website for wider public consultation. The following will also be posted on ADB website: (i) this updated IEE, reflecting the final design of the Project; (ii) corrective action plan, if any, prepared during subproject implementation to address unanticipated environmental impacts and to rectify non-compliance to EMP provisions; and (iii) environmental monitoring reports. The DBO contractor should keep copies of these documents at the work site / site office. Documents will also be available on the websites of KUIDFC and ByadgiTMC.

VII. GRIEVANCE REDRESS MECHANISM

152. A project specific grievance redress mechanism (GRM) will be established to receive, evaluate and facilitate concerns of, complaints and grievances of the DPs in relation to project's social and environmental performances. The main objective of the GRM will be to provide time bound action and transparent mechanism to resolve social and environment concerns.

153. A project GRM will cover the project's towns for all kinds of grievances and will be regarded as an accessible and trusted platform for receiving and facilitating project related complaints and grievances. The multi-tier GRM for the program will have realistic time schedules to address public grievances and specific responsible persons identified to address grievances.

154. Awareness on grievance redress procedures will be created through public awareness campaign with the help of print and electronic media and radio.

155. There will be multiple means of registering grievances and complaints by dropping grievance forms in complaint/ suggestion boxes at accessible locations, or through telephone hotlines, email, post or writing in a complaint register book in ULB's project office. There will be complaint register book and complaint boxes at construction site office to enable quick response of grievances/ complaints for urgent matters. The name, address and contact details of the persons with details of the complaint / grievance, location of problem area, date of receipt of complaint will be documented. The Regional ProgrammeManagementUnit (RPMU)officer in charge of environmental safeguards will be responsible at the project level for timely resolution of the environmental and social safeguards issues and registration of grievances, and communication with the aggrieved persons.

A. Grievance Redress Process

156. There will be several tiers for grievance redress process. Simple grievances for immediate redress will first be resolved at site by the DBO contractor. If unaddressed for up to 7 days the complainants may go to PIU officer in ULB responsible for resettlement/social issues. Resident/Environmental engineer and the community NGO will assist in resolving the issues. Name, designation and contact number of personnel responsible for grievance redress at ULB and RPMU will be posted at DBO contractors and Project Management Design and Construction Supervision Consultants (PMDCSC') site office in full visibility of public. CommunityNGO will be involved in community mobilization and awareness campaign among the communities. Grievances of immediate nature should be resolved at site/ within ULB/PIU level within 15 days of registration of grievances.

157. All grievances, that cannot be resolved by ULB/PIU within 15 days will be forwarded to RPMU's Officer in charge of environmental safeguards and PMDCSC consultant who will review and resolve within 15 working days of grievance registration with the assistanceofResettlement / Social Development officer and of the concerned PIU/ULB personnel, if required.

158. RPMU consists of SDO and PMDCSC Consultant in the GRC will review the grievances if any and the grievances of critical nature and those cannot be resolved at RPMU level should be referred to Grievance Redress Committee (GRC) set up at sub division headed by Special land acquisition officer/the Assistant Commissioner with a team of members.DPD of the concerned subdivision, the commissioner/chief officer of the ULBs,the most affected beneficiary,one vulnerable beneficiary and environmental engineer as members. All documents related to grievances, follow up action taken to resolve along with explanatory note on nature, seriousness and time taken for grievance redress shall be prepared by RPMU Officer in charge of environmental safeguards and circulated to GRC members at least a week prior to scheduled meeting. The decision taken at the GRC level will be communicated to the complainant byenvironmental specialist/Consultant through ULB/PIU. The GRC should be notified and in place before the starting of construction works by the contractor.

159. For any issues that remain unresolved by the GRC or the decision taken at such meetings is not acceptable, the complainants can approach the DLIC and then Court of Law as per Govt. of Karnataka legal procedure.

B. GRC composition and selection of members

160. The GRC for the project will be headed bySpecial land acquisition officer/the Assistant Commissioner with members as followed: (1)DPD of the concerned subdivision. (2) Commissioner/chief officer of the ULBs. (3)The most affected beneficiary. (4) one vulnerable beneficiary.(5) Environmental officer.appeals against the decision of the GRC are to be addressed to the Deputy commissioner of the concerned district.

161. In the event when the established GRM is not in a position to resolve the issue, affected person can use the ADB Accountability Mechanism through directly contact (in writing) to the Complaint Receiving Officer (CRO) at ADB headquarters or to ADB Indian Resident Mission (INRM). The complaint can be submitted in any of the official languages of ADB's DMCs. The ADB Accountability Mechanism information will include in the Project Information Document (PID) to be distributed to the affected communities, as part of the project GRM. The PID will be prepared by the DBO contactor in coordination with the PIU and consultant and get it approved by the EE/AEE in charge of the project. Grievance Redress Mechanism is shown in the Figure.8.

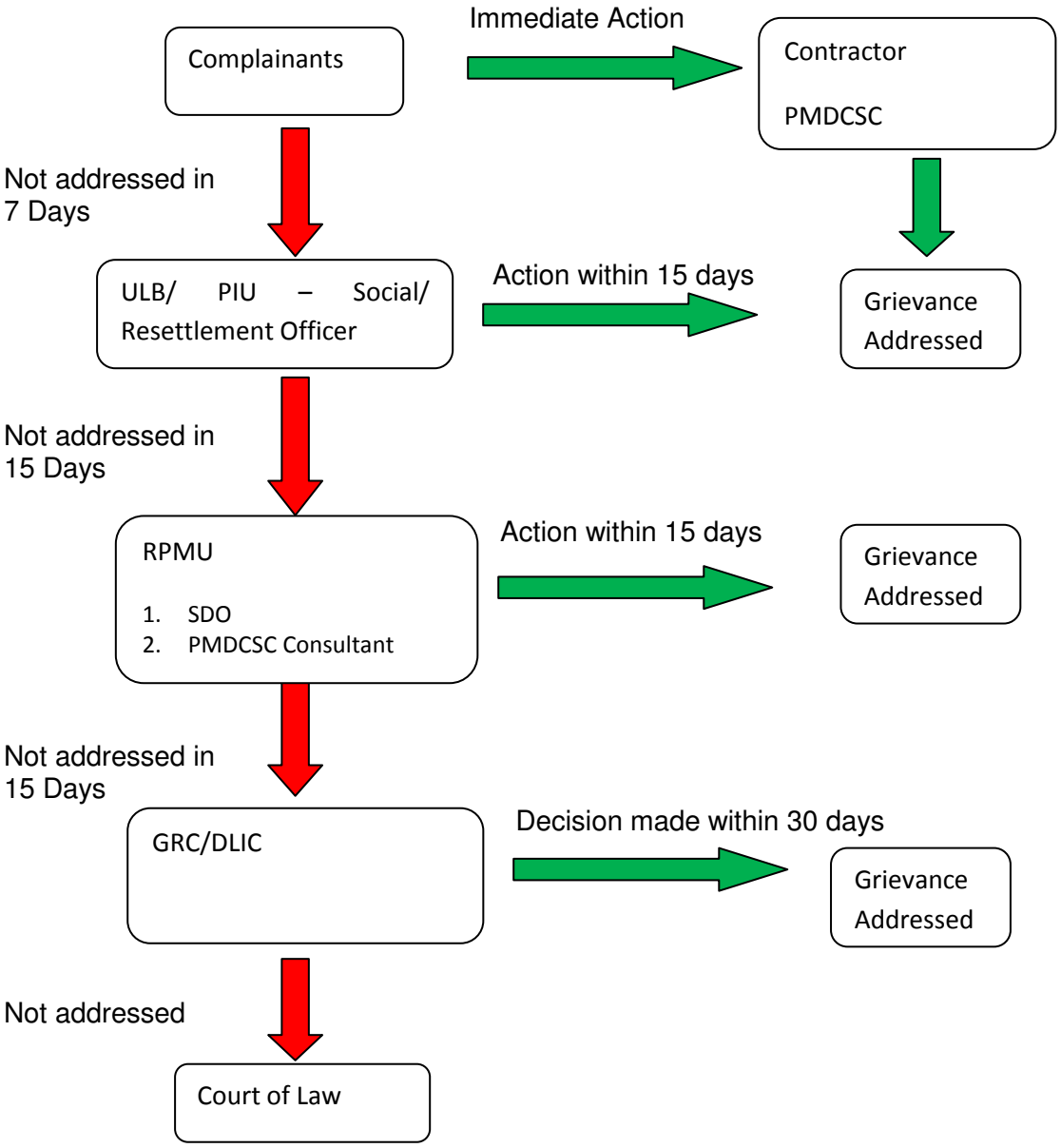


Figure 8: Grievance Redress Process

VIII. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

162. 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.

163. A copy of the EMP must be kept on 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.

164. The DBO 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 a budget for compliance with these EMP measures, requirements and actions.

165. Prior to starting of work, the DBO contractor should prepare Construction Management Plan. The Construction Management Plan should be site specific and has to submit every month before starting the work. The Construction Management Plan will include the method statement for construction works, Utility Management and Contingency Plan, Traffic Management Plan, Work camp and Labour Camp details, Safety measures taken for the workers and the public. etc.

166. The scope of work of DBO contractor should include operation and Maintenance period of six years to ensure smooth operation, training to the ULB staff and gradual transfer of facility to the Byadgi TMC

167. **Table 9 to 17** shows the potential adverse environmental impacts, proposed mitigation measures, responsible parties, and estimated cost of implementation. This EMP will be included in the bid documents and will be further reviewed and updated during implementation.

Table 9: Environmental Management Plan for Anticipated Impacts –Pre- Construction

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
STP site layout design	Nuisance to surrounding areas	• Develop a physical separation and visual screen around the facility; provide green buffer zone of 10-15 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. • Further 100 meter around the STP site declared as 'no development zone' and informed to Town Planning Department.	PIU, Design Consultant and Byadgi TMC	Review inclusion in the layout design; notification on no development zone	Part of project cost
STP process design	Nuisance to surrounding area and also negative impacts on receiving water body	• STP should be designed for following treated water disposal standards (for more details refer Appendix 10): ✓ BOD of 10 mg/l or less ✓ Suspended solids level of 100 mg/l ✓ Faecal coliform less than 1000/100 ml • Provide energy efficient design; this should be one of the main criteria for evaluation of different bidders • Develop a Sludge Management Plan	PIU, Design Consultant, DBO Contractor	Review & Check the inclusions / provisions in the DPR as appropriate	Part of project cost
STP design and operation	Nuisance to surrounding area and also negative impacts on receivingwater body	• Continuous uninterrupted power supply should be provided for the facility • Back-up facility (such as generator) shall be provided and adequate fuel supplies shall be ensured for running of generator when required; • Provide an 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. • The scope of work of DBO contractor should include an extended (~5 years) operation and	PIU, Design Consultant and Byadgi TMC	Review inclusion of measures in project and contract scope	Part of project cost

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		maintenance period to ensure smooth operation, training to the ULB staff and gradual transfer of facility to the Byadgi TMC. • Conduct regular wastewater quality monitoring (at inlet and at outlet) to ensure that the treated effluent quality complies with the standards • 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 • Utilize treated water for irrigation use in the surrounding fields			
Septic Tan Design	Septic Tank	• The location of the septic tank should not be close to any water body, wetland, drainage or flood way.	Design consultant and DBO Contractor	Design Report	NA
Layout design	Nuisance to surrounding areas	• A green buffer zone of 5 m wide around the septic tank; 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 and will also reduce the odour nuisance. • Create awareness among the users on the function of Septic tanks, do's and don'ts and operationalmodalities	PIU, Design Consultant and Byadgi TMC	Review inclusion of measures in project and contract scope	Part of project cost
Diesel Generator	Air emissions and noise	• Diesel generator shall be procured for CPCB authorized manufacturers with proper acoustic enclosures (refer KSPCB CFE) • Development generator room appropriately • Provide a minimum of 5 m high emission stack	PIU, Design Consultant, DBO Contractor	Review & Check the inclusions / provisions in the DPR as appropriate	Part of project cost

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
Sewer Design	Drinking water supply lines may be contaminated due to leakage from sewers	• Limit the sewer depth where possible. • Sewers shall be laid away from water supply lines and drains (at least 1 m, wherever possible); • In all cases, the sewer line should be laid deeper than the water pipeline (the difference between top of the sewer and bottom of water pipeline should be at least 300 mm) • In unavoidable, where sewers are to be laid close to storm water drains or canals or natural streams, appropriate pipe material shall be selected (stoneware pipes shall be avoided) • For shallower sewers, use small inspection chambers in lieu of manholes; • Design manhole covers to withstand anticipated loads & ensure that the covers can be readily replace if broken to minimize silt/garbage entry • Ensure sufficient hydraulic capacity to accommodate peak flows & adequate slope in gravity mains to prevent build-up of solids and hydrogen sulphide generation • Equip pumping stations with a backup power supply, such as a diesel generator, to ensure uninterrupted operation during power outages, and conduct regular maintenance to minimize service interruptions. Consider redundant pump capacity in critical areas • Establish routine 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	PIU, Design Consultant, DBO Contractor	Review & Check the inclusions / provisions in the DPR as appropriate	Part of project cost

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		at manhole; frequent line blockages; lines that generally flow at or near capacity; and suspected infiltration or exfiltration; and o Monitoring of sewer flow to identify potential inflows and outflows • Conduct repairs prioritized based on the nature and severity of the problem. Immediate clearing of blockage or repair is warranted where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, or sewer line blockages); • Review previous sewer maintenance records to help identify "hot spots" or areas with frequent maintenance problems and locations of potential system failure, and conduct preventative maintenance, rehabilitation, or replacement of lines as needed; • When a spill, leak, and/or overflow occurs, keep sewage from entering the storm drain system by covering or blocking storm drain inlets or by containing and diverting the sewage away from open channels and 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. • 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			
Utilities	Disturbance/damage to existing utilities on the sites (Telephone lines,	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase;	PIU, Design Consultant, DBO Contractor	Review & Check the inclusions / provisions in the DPR as appropriate	Part of project cost

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
	electric poles and wires, water lines within proposed project sites)	• Conduct detailed site surveys with the construction drawings and discuss with the respective agencies during the construction phase before ground clearance, and • Require DBO contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. In case of disruption of water supply, alternative supply, through tankers, shall be provided.			
Emergencies	Emergencies such as leaks, overflows, bursts and bad odours and poor treatment at	• Develop Emergency Response Plan for all emergencies such as leaks, overflows, bursts; a template of ERP is provided at Appendix 7	PIU, DBO Contractor and TMC	Review & Check the inclusions / provisions in the DPR as appropriate	Part of project cost
Clearances and Permits	Failure to obtain the statutory clearances and permits may delay the construction activities	• Ensure to obtain all the necessary clearances and permits before the start of construction activities.	PIU, DBO Contractor and TMC	Verification of the licences and permits	Part of project cost

Table 10:Environmental Management Plan for Anticipated Impacts –Construction

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
Construction impacts	Impacts due to excess excavated earth, excess construction materials, solid waste etc. Occupational hazards which can occur to workers and public during work.	Prepare and submit a Construction Management Plan, every month, before starting the work. The method statement for the construction works should be part of the Construction Management Plan. The method statement for pipeline and sewer works will be in a Table format with appended site layout map and cover the following: • Work description; No. Of workers (skilled & unskilled); Details of Plant, equipment & machinery, vehicles • Work duration (total, and activity-wise, for example for pipe laying, from excavation to road	DBO Contractor	Site Inspection and record verification Site specific OH & S Spoil and Waste Management Plan	Good construction practice to be followed by contractor – no additional costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		resurfacing/testing) • PPE (helmet, gloves, boots, etc) details for each type of work • Details of materials at each site (type & quantity) • Risks/hazards associated with the work (for example, Trench excavation will have risks such as trench collapse, persons/vehicles falling into trench, structural risk to nearby buildings, damage to buildings, infrastructure etc) • Construction waste/debris generated (details & quantity) • Detail the sequence of work process (step-by-step) including specific details of each work • Contractor's supervision & management arrangements for the work • Emergency: Designate (i) responsible person on site, and (ii) first aider • Typical site layout plan including pipe trenching, placement of material, excavated earth, barricading etc • The pipeline/sewers are to be laid along the roads, The excavated soil, placed along the trench may get disturbed due to wind, rain water and the movement of workers, vehicles and pedestrians, and spill onto road way – disturbing road users, creating dust, road safety issues, etc, and also into nearby open drains. The following should be included in the site layout plan: ✓ Provide barricading/security personnel at the site to prevent entry/trespassing of pedestrian/vehicles into the work zone ✓ Location of temporary stockpiles and provision of bunds ✓ Separation of stockpiles areas with workers/vehicle movement paths to avoid		Complaints from sensitive receptors and public	

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		disturbing the stockpiled soil ✓ Wetting of soil to arrest dust generation by sprinkling water ✓ Waste/surplus soil utilization and disposal plan – indicate expected duration of temporary stockpiling along the trench at each site and identify final surplus soil utilization/disposal site in consultation with PIU			
Utilities	Disturbance/ damage to existing utilities on the sites (Telephone lines, electric poles and wires, water lines within proposed project sites)	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase	PIU	Review and check inclusions / provisions in the DPR as appropriate	Part of project cost
		• Prepare a contingency plan to include actions to be done in case of unintentional interruption of services. The contingency plan should be included in the Construction Management plan. • A micro planning on utilities need to be included in the Construction Management Plan and to be submit before the start of the construction works. The micro planning should cover the possible disturbance to the utilities and suggested precautions / restoration plan. • Conduct detailed site surveys with the construction drawings and discuss with the respective agencies during the construction phase before ground clearance; • In case of disruption of water supply, alternative supply, through tankers, shall be provided; water may be made available by the Byadgi TMC, but it will the responsibility of contractor to supply to affected people	DBO Contractor	Utility Contingency Plan	
Work Camps	Construction work	• Prioritize areas within or nearest possible vacant	DBO Contractor	List of selected	Good

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
	camps, stockpile areas, storage areas, and disposal areas (disruption to traffic flow and sensitive areas and receptors)	space in the subproject location; • Construction work camps shall be located at least 200 m from residential areas • Do not consider residential areas for stockpiling the waste/surplus soil • Material stockpiles shall be protected by bunds during the monsoon to arrest the silt laden runoff into drains. • The details of the work camps should be included in the Construction Management Plan.		sites for construction work camp, storage area and disposal area. Complaints from sensitive receptors. Site Observation	construction practice to be followed by contractor – no additional costs
Source of construction materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution	• Contractor should obtain material from existing mines approved/licensed by Mines and Geology Department/ Revenue Department. • Verify suitability of all material sources and obtain approval of implementing agency • No new quarry sites shall be developed for the subproject purpose • Submit a monthly statement of construction material procured indicating material type, source and quantity.	DBO Contractor	Check sources and approval	Good construction practice to be followed by contractor – no additional costs
Air quality	Dust and emissions from construction activity may degrade the air quality	• Consult with PIU on the designated areas for stockpiling of clay, soils, gravel, and other construction materials; • Damp down exposed soil and any stockpiled on site by spraying with water when necessary during dry weather; • Bring materials (aggregates, sand, etc gravel) as and when required; • Use tarpaulins to cover sand and other loose material when transported by vehicles; • Clean wheels and undercarriage of vehicles prior to leaving construction site • Fit all heavy equipment and machinery with air pollution control devices which are operating	DBO Contractor	Site observation Informal Public Consultation Complaints from sensitive receptors	Good construction practice to be followed by contractor – no additional costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		correctly; ensure valid Pollution Under Control (PUC) Certificates for all vehicles and equipment used in the construction activity			
Noise Level	High noisy construction activities may have adverse impacts on sensitive receptors and structures	• Plan activities in consultation with the PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; • Construction work shall be limited to day light hours (6 AM to 6 PM) for all the works located within the town; • Provide prior information to the local public about the work schedule; • Ensure that there are no old and sensitive buildings that may come under risk due to the use of pneumatic drills; if there is risk, cut the rocks manually by chiselling; • Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and • Maintain maximum sound levels not exceeding 80 decibels (dB) when measured at a distance of 10 m or more from the vehicle/s	DBO Contractor	Complaints from sensitive receptors	Good construction practice to be followed by contractor – no additional costs
Water Quality	Impacts on surface drainage and water quality due to contaminated runoff from construction areas in monsoon	• Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets • Stockpiles shall be provided with temporary bunds • Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with Implementing Agency on designated disposal areas • Install temporary silt traps or sedimentation basins along the drainage leading to the water	DBO Contractor	Site Observations Water Quality test records	Good construction practice to be followed by contractor – no additional costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		bodies • Place storage areas for fuels and lubricants away from any drainage leading to water bodies • Dispose any wastes generated by construction activities in designated sites			
Landscape and aesthetics	Impacts on landscape and aesthetics due to construction activity	• Prepare and implement Waste Management Plan – it should present how the surplus waste generated will temporarily stocked at the site, transported and disposed properly. The Waste Management Plan will be part of the Construction Management Plan. • Avoid stockpiling of excess excavated soils as far as possible • Avoid disposal of any debris and waste soils in the forest areas and in or near water bodies/rivers; • Coordinate with PIU for beneficial uses of excess excavated soils or immediately dispose to designated areas	DBO Contractor	Work site inspection. Complaints from public	Good construction practice to be followed by contractor – no additional costs
Protected Monuments	Damage to protected structures due to construction along the areas near to protected monuments	All necessary and adequate care should be taken to minimize the impact on protected properties. If articles such as fabrics, coins, artefacts, structures or other geologically or archeologically important materials are discovered, the excavation should be stopped and the Archaeological Department should be intimated at the earliest and all the articles received during the sewer laning should be handed over to ASI Byadgi TMC should include the above instruction in the contract document.	DBO Contractor	Work site inspection	Good construction practice to be followed by contractor – no additional costs
Nuisance/ disturbance to sensitive areas due construction work in the	Schools, hospitals and religious places	• No material should be stocked in this area; material shall be brought to the site as and when required • Conduct work manually with small group of workers and less noise; minimize use of	DBO Contractor	Complaints from sensitive receptors Work Program	Good construction practice to be followed by

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
proximity (within 250 m of such place)		equipment and vehicles • No work should be conducted near the religious places during religious congregations • Material transport to the site should be arranged considering school timings; material should be in place before school starts; • Notify concerned schools, hospitals etc 2 weeks prior to the work; conduct a 30 minutes awareness program at on nature of work, likely disturbances and risks and construction work, mitigation measures in place, entry restrictions and dos and don'ts • Implement all measures suggested elsewhere in this report – dust and noise control, public safety, traffic management, strictly at the sites.		Review	contractor – no additional costs
Socio- Economic: Livelihood	Impediment of access to houses and business	• Leave space for access between mounds of excavated soil • Provide wooden planks/footbridges for pedestrians and metal sheets for vehicles to allow access across trenches to premises where required • Consult affected businesspeople; inform them in advance when work will occur • Address livelihood issues; implement the Resettlement Plan (RP) to address these issues • Provide sign/caution/warning boards at work site indicating work schedule and traffic information; prevent public entry into work sites through barricading and security; and • Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.	DBO Contractor	Number of walkways, wooden plans and foot bridges Complaints from public Spoil Management Plan	Good construction practice to be followed by contractor – no additional costs
	Temporary impact on business to the shop keepers, , hawkers and	• Provision of advance notice to community to shift their merchandise, vending items, mobile shops at least 7 days prior to construction work;	DBO Contractor	Notice to the vendors and other	Good construction practice

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
	vendors (with moveable structures and footpath sellers)	• Conducting awareness campaigns through a media partner, if any and the project resettlement & monitoring NGO with signage for road diversion, safety caution, etc; • Maintaining access to shops by providing planks and leaving spaces to avoid disturbance to residents and businesses; • Open pits to be guarded properly against safety hazard, especially during day time working period, near road crossings, near schools, etc; • Managing traffic flows as per the traffic management plan prepared by the contractor in coordination with local authorities and communities; • Conducting major portion of the works at night, if possible, to avoid / reduce the inconvenience to public and shopkeepers. • Closing the open trenches immediately after pipe laying; • Completing works quickly where large numbers of businesses are located; • Avoiding full road closure to the extent possible; • Placing telephone number on visible areas to notify in case of emergency; • Making the community fully aware of the grievance redress mechanism; • Providing contact number of responsible persons in the PMU and ULB offices, • Providing assistance to vendors and hawkers in shifting to alternative nearby locations and help reinstallation of their business as early as possible		concerned. Details of the awareness camps conducted. Complaints / feedback from shop owners / vendors	to be followed by contractor – no additional costs
Socio-Economic: Employment	Employment generation	• Employ at least 50% of the labour force, or to the maximum extent, local persons if manpower is available	DBO Contractor	Employment Records	NA

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		• Secure construction materials from local market.		Compliance to labour laws	
Working with AC Pipes	Impact on construction workers during sewer laning along the existing sewer / abandoned network with AC pipes. AC pipes can be carcinogenic if inhaled as dust particles	• Train all construction personnel in dangers of AC pipes and how to recognise them in situ. • Develop and apply protocol if AC pipes are encountered.	DBO Contractor	Site inspection and checking of records	Good construction practice to be followed by contractor – no additional costs
Occupational Health and Safety	Workers occupational health & safety	• Develop and implement site-specific Health and Safety (H and 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) H and S Training[8] for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; • All trenches deeper than 2 m shall be protected with wooden bracing to avoid safety risks to workers, public and nearby buildings/structures • Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site; • Provide medical insurance coverage for workers;	DBO Contractor	Site Specific OH & S. Equipped first aid station Potable water supply Clean eating area PPE and medical insurance	Good construction practice to be followed by contractor – no additional costs

[88]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 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.

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		• Secure all installations from unauthorized intrusion and accident risks; • Provide supplies of potable drinking water; • Provide clean eating areas where workers are not exposed to hazardous or noxious substances • Provide H and 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; • Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; • Ensure moving equipment is outfitted with audible back-up alarms; • 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; • Disallow worker exposure to noise level greater than 85 dB for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively. • Overall, the contractor should comply with IFS EHS Guidelines on Occupational Health and Safety (this can be downloaded from			

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		http://www1.ifc.org/wps/wcm/connect/9aef2880488559a983acd36a6515bb18/2%2BOccupational%2BHealth%2Band%2BSafety.pdf?MOD=AJPERES). • The measures adopted for ensuring the workers safety should be part of the Construction Management Plan.			
Community health & safety	Danger due to deep excavations, hindrance to traffic and chances of accident.	• Provide wooden bracing for all deep excavations (> 2m); identify buildings at risk prior to start of excavation work and take necessary precautions for safe work • Plan material and waste routes to avoid times of peak-pedestrian activities • Liaise with Byadgi TMC in identifying risk areas on route cards/maps; identify buildings at risk prior to start of excavation work and take necessary precautions for safe conduct of work • Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure • Provide road signs and flag persons to warn of dangerous conditions, for all the sites along the roads • Overall, the contractor should comply with IFC EHS Guidelines Community Health and Safety (this can be downloaded from http://www1.ifc.org/wps/wcm/connect/dd673400488559ae83c4d36a6515bb18/3%2BCommunity%2BHealth%2Band%2BSafety.pdf?MOD=AJPERES	DBO Contractor	Traffic Management Plan Complaints from public	Good construction practice to be followed by contractor – no additional costs
Worker camp	Temporary worker camps	• The contractor should establish and operate the temporary worker camps in compliance with IFC EHS Guidelines specific to workers accommodation ((this can be downloaded from	DBO Contractor	List of selected sites. Written consent	Good construction practice to be

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		http://www1.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/publications/publications_gpn_workersaccommodation), including the following: • Consult with PIU before locating workers camps/sheds, and construction plants; as far as possible located within reasonable distance of work site • Minimize removal of vegetation and disallow cutting of trees • Living facilities shall be built with adequate materials, and should be in good condition and free from rubbish and other refuge • The camp site should be adequately drained to avoid the accumulation of stagnant water • Provide water and sanitation facilities; water, meeting Indian drinking water standards shall be provided, in adequate quantities (supply of 60-80 LPCD); all water storage structures must be cleaned regularly and covered properly to avoid any contamination • Provide separate facilities for men and women; sanitary facilities shall be properly build and well maintained; toilet and bath facilities should be provided on basis of 1 per 15 or less persons • Train employees in the storage and handling of materials which can potentially cause soil contamination; • Recover used oil and lubricants and reuse or remove from the site; • Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; • Remove all rubbish, or temporary structures which are no longer required		of land owner Waste Management plan	followed by contractor – no additional costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		• Report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.			

Table 11:Environmental Management Plan for Anticipated Impacts –Operation

Field	**Anticipated Impact**	**Mitigation Measures**	**Responsible for Implementation**	**Monitoring of Mitigation**	**Cost and Source of Fund**
Odour	Odour nuisance from the treatment plants	• Follow standard guidelines in O & M Manual. A draft is given in Appendix 12.	TMC and DBO Contractor	Site inspection and records verification	Part of project O&M cost
Pollution and health hazards due to improper sludge disposal methods	Contaminated work area may cause health hazards	• Safe sludge handling methods shall be employed. PPE shall be provided. Sludge shall be dried in drying beds before disposal. • Sludge Management Plan shall be implemented	TMC and DBO Contractor	Site inspection and records verification	Part of project O&M cost
Water Quality check at the inlet and outlet of the STP	Failure to ensure the recommended contaminant limit could cause the deterioration water quality where it is discharging	• Conduct Daily/Weekly/Monthly quality check at inlet and out, recommended in Appendix 14.	TMC and DBO Contractor	Water Quality Analysis Register	Part of project O&M cost
Septic Tank operation	Blockage, overflow etc will cause health issues, bad odour and nuisance to the people	• Ensure that there is no entry of chemicals (e.g. acid and alkaline agents) or non-biodegradable materials which may have an adverse effect on the functioning of the septic tank • Keep the tank and its surrounding area neat and clean, • Never discharged wastewater mixed with oil which will upset the digesting function of the septic tank and generate scum and foul odour. If it is unavoidable, install a gravity baffle chamber for use as an oil-water	DBO Contactor/ TMC / User groups	Operation guidelines, Inspection of site and record	Part of project O&M cost

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		separator in the upstream of the septic tank. • Create awareness among the septic tank users for proper usage to avoid malfunction • Should be emptied at regular in(recommended annually) using a sucking and jetting machine and empty to the STP plant. • Implement appropriate operation and maintenance procedure as per the design, training of maintenance staff, and provision of appropriate maintenance equipment			
Septic Tank operation	Damage to the Septic tank or top slab, in case any heavy vehicle parks on the septic tank	• The area will be separated with fencing or similar measures. • Warning board will be installed • The top slab should be at a height from the ground surface (30 cm as per the design)	DBO Contractor	Inspection of site and records	Part of project O&M cost
General maintenance and repair of sewer system	Nuisance and disturbance to people, disruption services etc	• Follow standard procedures as prescribed by O&M Manual (A draft is given in Appendix 12) • Ensure that all necessary equipment and tools are available for regular maintenance, especially for sewer network; including the personal protection equipment like masks, gloves including oxygen cylinders in the event of hazardous working conditions during the sewer maintenance. • Ensure there is no overflow of sewers due to blockages or leaks; in case of occurrence, attend to these at the earliest • Implement all necessary mitigation measures suggested during construction (to avoid disturbance and inconvenience to people, business and traffic) • Treat/dispose/utilize the sludge as per the sludge management plan. Ensure operation and maintenance of sewer network as per the standard operating procedures to avoid, over flows, blockages, etc and immediately conducting the maintenance work in case of such occurrences	TMC and DBO Contractor	Site inspection and records verification	Part of project O&M cost

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Fund
		• Implement Emergency Response Plan (ERP template is provided in Appendix 8 for reference) for events such as burst/leaks/overflows of sewers etc)			
Discharge of Hazardous Chemicals into Sewer lines	Damage to sewer and health risk to sewer cleaning and STP workers, negative impact on performance of STP and pollution in water bodies receiving treated effluent	• Ensure that no wastewater, except domestic sewage is disposed in to the sewers; the rules and regulations will be strictly implemented to avoid discharge of hazardous chemicals into sewers.	KSPCB,TMC and DBO Contractor		Part of O&M Cost.

Table 12:Environmental Monitoring Plan`

Sample	Site/s	Responsibility	Parameter to monitor	Frequency	Who	Cost (INR)
Construction						
Ambient air quality and noise	5 points (shall be selected during construction) STP – 1 point; pipeline locations in the town – 4points, including 1 near septic tank)	Contractor	• PM10, PM2.5,, SOx, NOx • Monitoring method as prescribed by CPCB	Once before start of construction Quarterly (yearly 4-times) during construction	DBO Contractor	Rs. 10000 per sample for 60 nos. – sum Rs. 6,00,000
Noise Level	5 points (shall be selected during construction) STP – 1 point pipeline locations in the town – 4 points, including 1 near septic tank).	Contractor	• Noise level • Day and night time noise (dB) • Monitoring method as prescribed by CPCB	Once before start of construction Quarterly (yearly 4-times) during construction	DBO Contractor	Rs. 2500.00 per sample Rs. 1,50,000 for 60 samples
Operation						
Monitoring of raw &treated wastewater quality from STP	Inlet and outlet of STP	Operator	The parameters to be checked are given in table in the Appendix 15	The daily / weekly / Monthly parameters to be monitored are given in Appendix 14	DBO Contractor through accredited lab	Part of laboratory O&M Costs
Quality of receiving water body	Shanbogarnallah near STP site, and Hombardi lake	Operator	General surface water quality parameters	Once prior to start of STP operation & yearly twice in operation (pre & post monsoon)	DBO Contractor through accredited lab	DBO Contractor through accredited lab
Sludge quality and suitability as manure	Sludge drying beds STP	Operator	The parameters to be checked are given in table in the Appendix 15	The daily / weekly / Monthly parameters to be monitored are given in Appendix 14	DBO Contractor through accredited lab	Part O&M costs
Monitoring of treated quality of wastewater from septic tank	Outlet of Septic tank	Operator	The parameters to be checked are given in table in the Appendix 15	The daily / weekly / Monthly parameters to be monitored are given in Appendix 14	DBO Contractor through accredited lab	Part of laboratory O&M Costs

B. Institutional Arrangements

168. **Executing Agency (EA):** Karnataka Urban Infrastructure Development & Finance Corporation (KUIDFC) is the executing agency (EA) responsible for implementing the Investment Program. Investment Program implementation activities will be monitored by Program Management Unit (PMU) ofKIUWMIP, headed by Task Manager KIUWMIP Head Office Bangalore.

169. A new Regional Program Management Unit (RPMU) established at Davangere. A Consultant Team will be appointed by EA and the team will work under the Deputy Project Director (DPD) and will be involved in project planning, preparation of subproject and cost estimates, co-ordination, technical guidance and supervision, financial control, training and overall subproject management.

170. Interactions with GoK, GoI and ADB shall be conducted through the KUIDFC office at Bangalore.

171. **Implementing Agency (IA):** The ultimate implementation responsibility lies with respective ULBs (in this case Byadgi Town Municipal Corporation). A Programme Implementation Unit (PIU) will be established in each ULB unless the ULBs decide to form a single PIU.

172. Other than the above institutional setup, District Level Implementation Committee will be set up in each district to monitor implementation of subprojects and institutional reforms. The District Level Implementation Committee shall consist of Deputy Commissioner of District, Deputy Project Director from concerned RPMU, Municipal Commissioners' / Chief Officers of ULB and PMDCSC representative.

173. At the Executing Agency (i.e. KUIDFC), environmental issues will be coordinated centrally by an Environmental Specialist (designated as Assistant Executive Engineer-Environment), reporting to the Task Manager. Assistant Executive Engineer – Environment will ensure that all subprojects comply with environmental safeguards. The IEE/EIA reports will be prepared by the Consultant Team, and will be reviewed by the Assistant Executive Engineer-Environment as per the ADB's Environmental Guidelines and forwarded to ADB for review and approval. In case of IEE reports, the ADB could delegate approval of IEE reports fully to the PMU after reviewing the first two reports. However, all the EIA reports shall be sent to ADB for approval. The Assistant Executive Engineer-Environment, KUIDFC, Head office will be assisted by an Environment Consultant in Davanagere in PMDCSCTeam

174. The responsibility fulfilling environmental requirements of GoI/GoK and conducting required level of environmental assessment as per ADB guidelines lies with the implementing agency, i.e. ByadgiTMC. The Consultant Team will assist the TMC in this regard.

175. The mitigation measures identified through IEE/are incorporated into the Investment Program cycle. Mitigation measures, which are to be implemented by the Contractor, shall form part of the Contract Documents. The other mitigation measures are undertaken by the IA (itself or in assistance with the Consultant Team) as specified in the IEE. During the construction phase, environmental Consultant team will monitor the implementation of the EMP and report to the PMU. The Implementation of EMP and other environmental related measures and the results of environmental monitoring conducted during implementation will be reported to ADB through semi-annual Environmental Monitoring Reports. These will also be made available on executing agency (KUIDFC) website for wider public access.

176. **Consultants:** Deputy Project Director is being assisted by a consultant team in project planning, preparation of project and cost estimates, coordination, technical guidance and supervision, financial control, training and overall project management. The consultant team includes an environmental consultant to supervise the implementation of environmental

safeguards at the RPMU level. The consultant team also includes a Resident Engineer (RE) at each ULB/TMC responsible for the supervision of project implementation including environmental safeguards at each ULB/TMC level.

177. **DBOContractor**: The contractor shall appoint one supervisor who will be responsible on a day-today basis for i) ensuring implementation of EMP ii) Coordinating the RE and environment specialists (all levels) iii) community liaison, consultation with interested / affected parties and grievance redressal and iv) reporting.

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

179. The following figure (**Figure 8**) and table (**Table 15**) summarizes the institutional responsibility of environmental safeguards at all stages of the project.

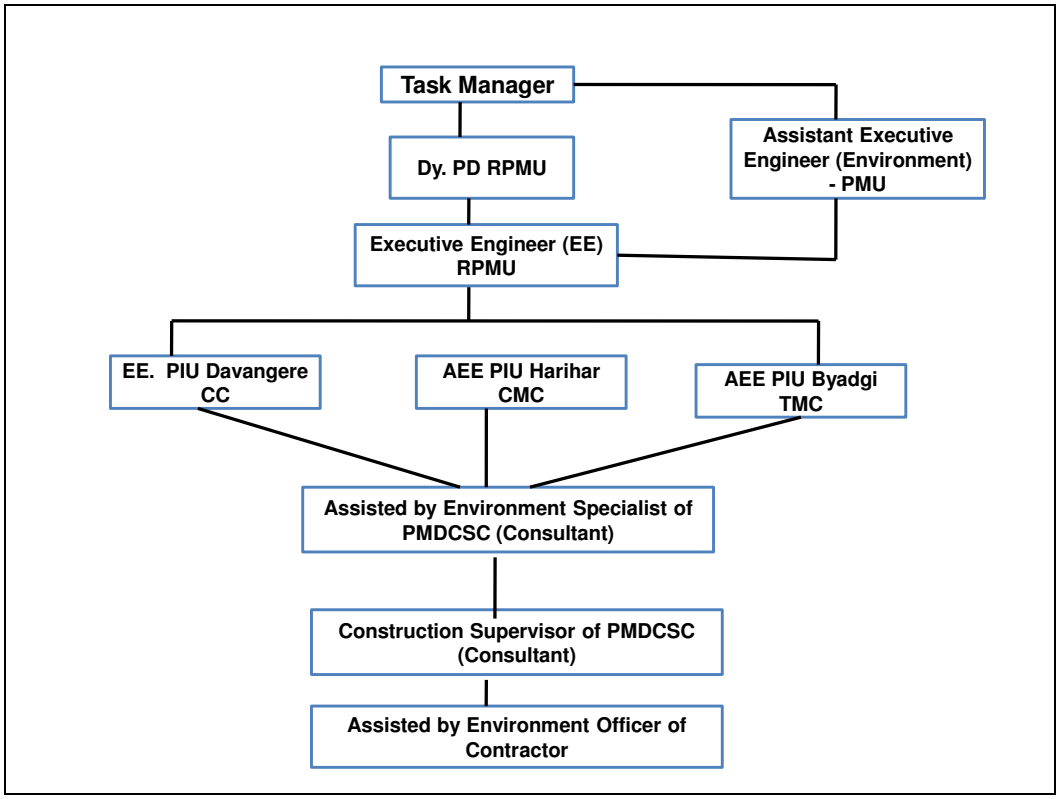
Table 13:Institutional Roles and Responsibilities

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
Task Manager	(i) Review REA checklists and assign categorization based on ADB SPS (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 KUIDFC website 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 (i) Organize an orientation workshop for PMU, ULBs/TMCs, 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 labor standards, (d) OH&S, (e) EMP implementation especially spoil management, working in	(i) Task Manager is responsible for over-all environmental safeguards compliance of the project (ii) Prepare and submit to ADB semi-annual monitoring reports (iii) Review and submit Corrective Action Plans to ADB (iv) Organize capacity building programs on environmental safeguards (v) Coordinate with national and state level government agencies (vi) Assist in addressing any grievances brought about through the Grievance Redress Mechanism. ...manner as per the IEEs.	Compliance monitoring to review the environmental performance of project component, if required and as specified in EMP
Assistant Executive Engineer (Environment)		(i) Assist in the preparation of semi-annual monitoring reports (ii) Monitor and ensure compliance of EMPs as well as any other environmental provisions and conditions. (iii) If necessary prepare Corrective Action Plan and ensure implementation of corrective actions to ensure no environmental impacts; (iv) Organize capacity building programs on environmental safeguards at regional / divisional level	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**
	congested areas, public relations and ongoing consultations, grievance redress, etc. (ii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs. (iii) 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. (iv) Ensure compliance with all government rules and regulations regarding site and environmental clearances as well as any other environmental requirements (v) Assist PMU, PIUs, and project NGOs to document and develop good practice construction guidelines to assist the contractors in implementing the provisions of IEE. (vi) Assist in the review of the contractors' implementation plans to ensure compliance with the IEE.	(v) Coordinate with regional level government agencies (vi) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (vii) Assist in overseeing implementation of the EMP during construction including environmental, health and safety monitoring of contractors; (viii) Coordinate with the General Manager, environmental Experts, TMCs, NGOs, consultants and contractors on mitigation measures involving the community and affected persons and ensure that environmental concerns and suggestions are incorporated and implemented.	
ULB/TMC	(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	(i) Ensure EMP implementation is included in measuring works carried out by the contractors and certifying payments. (ii) Ensure Corrective Action Plan is implemented. (iii) Conduct public awareness campaigns and participation programs (iv) Prepare monthly reports. (iv) Address any grievances	(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**
	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. (v) EMP implementation regarding sites for disposal of wastes, camps, storage areas, quarry sites, etc. (vi) Ensure contractors undergo EMP implementation orientation prior to start of civil works	brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs	
Environmental Consultant at ULB/TMC level Resident Engineer at ULB/TMC level	(i) Assist ULBs/TMCs in preparation of REA checklists and EIAs/IEEs (ii) Assist ULBs/TMCs 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 reports (v) 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.
DBO Contractors	(i) Undergo EMP implementation orientation prior to award of contract (ii) Provide EMP implementation orientation to all workers prior to deployment to worksites (iii) Seek approval for	(i) Implement EMP. (ii) Implement corrective actions if necessary. (iii) Prepare and submit monitoring reports to ByadgiTMC (iv) Comply with all applicable legislation, is conversant with the requirements of the EMP;	(i) Ensure EMP post-construction requirements are satisfactorily complied (ii) Request certification from ULBs/TMCs

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	camp sites and sources of materials. (iv) 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.	(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 ULBs/TMCs and CSS are timely informed of any foreseeable activities related to EMP implementation. (ix) Address any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs	



IX. ENVIRONMENTAL SAFEGUARD IMPLEMENTATION ARRANGEMENTS

C. Training Needs

180. 1.The following **Table 16**, below presents the outline of cost for capacity building program to ensure EMP implementation. The estimated cost is Rs. 2, 00,000.00 (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..

Table 14:Outline of Capacity Building Program on EMP Implementation

Description	Target Participants	Estimate (INR) – (Lump sum)	Cost and Source of Funds
1. Introduction and sensitization to environment issues (1 day) - ADB Safeguards Policy Statement - Government of India and Karnataka 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	25,000.00	PMU cost
2.EMP implementation (3 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 project All contractors prior to award of contract	75,000.00	PMU cost
3. Plans and Protocols (3 days) - Construction site standard operating procedures (SOP) - AC pipe protocol - Site-specific EMP - Traffic management plan - Spoils management plan - Waste management plan - Chance find protocol - O&M plans - Post-construction plan	All staff and consultants involved in the project DBOcontractor and staff prior to award of contract or during mobilization stage.	75,000.00 25,000.00	PMU cost DBO Contractors cost as compliance to contract provisions on EMP implementation (refer to EMP tables)
4. Experiences and best	All staff and	25,000.00	PMU Cost

Description	Target Participants	Estimate (INR) – (Lump sum)	Cost and Source of Funds
practices sharing - Experiences on EMP implementation - Issues and challenges - Best practices followed	consultants involved in the project DBO Contractor and his staff, All NGOs		
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	10,000.00	DBO Contractors cost as compliance to contract provisions on EMP implementation (refer to EMP tables)
Total cost for Capacity Building Programme on EMP Implementation		2,35,000.00	

PMU Fund - 2, 00,000.00
DBO Contractor Cost - 35,000.00
Total cost for Capacity Building Programme - 2, 35,000.00

D. Monitoring and Reporting

181. Prior to commencement of the work, the contractor will submit a compliance report to ULB/TMC ensuring that all identified pre-construction environmental impact mitigation measures as detailed in the EMP will be undertaken. ULB/TMC with the assistance of the environmental consultant will review the report and thereafter ULB will allow commencement of works.

182. During construction, results from internal monitoring by the contractor will be reflected in their weekly EMP implementation reports to the Resident Engineer. These weekly report will be retained in PMDCSC for reference. Resident Engineer will review and advise contractor for corrective actions if necessary. Monthly report summarizing compliance and corrective measures taken will be prepared by Resident Engineer to be reviewed and endorsed by ULB and consolidated monthly report will be submitted to PMU.

183. Based on monthly reports and measurements, PMU will draft, review, and submit to ADB, 6-monthly (twice a year) EMP implementation progress report (**Appendix 14**). Once concurrence from the ADB is received the report will be disclosed in the KUIDFC/ULB website.

184. ADB will review project performance against the KUIDFC's 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

185. Most of the mitigation measures require the DBO 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 DBO 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 TMCs 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. The EMP cost includes the cost for providing water supply and sanitation facilities for the

workers. In addition to this, hard barricades need to be provided at the work sites to prevent any entry of the public or animals into the worksite and to prevent any possible accidents.

186. The cost for implementing the EMP, including the ambient environmental quality monitoring during the construction of the Sewerage network and the STP are given in **Tables 17**below.

Table 15:Cost Estimates to Implement the EMP

No	Particulars	Stages	Unit	Number	Rate	Cost (INR)	Costs Covered By
A.	**Monitoring Measures**						
1	Air quality monitoring	Construction	Per location	60	10000	6,00,000	DBO Contactor
2	Noise levels monitoring	Construction	Per location	60	2500	1,50,000	DBO Contractor
	Sub Total					7,50,000	
B	**Capacity Building**						
1	Introduction and sensitization to environment issues	Pre-construction	lump sum			25,000	PMU
2	EMP implementation	Construction	lump sum			75,000	PMU
3	Plans and Protocols	Construction	lump sum			75,000	PMU
			lump sum			25,000	DBO Contractor
4	Experiences and best practices sharing	Construction/ Post-Construction	lump sum			25,000	PMU
5	Contractors Orientation to Workers on EMP implementation	Prior to dispatch to worksite	Lump sum			10,000	DBO Contractor
	Subtotal (B)					2,35,000	
C	**Civil Works**						
1	Construction of shelters for workers.	Construction	Lump sum			3,00,000	DBO Contractor
2	Providing Water Supply Facility for the workers	Construction	Lump sum			1,00,000	DBO Contractor
3	Providing Sanitation Facility for the workers	Construction	Lump sum			1,00,000	DBO Contractor
4	Barricades at the worksite (MS Sheet of 20 gauge of size 5 x 3 meters, having vertical support by MS flat (65 x 65 x 6 mm) along the sides and at 1.5 m and 3.5m, horizontal support by MS flat (65 x 65 x 6 mm) along the sides and at the center, supported by 50mm MS hollow pies of 4 meter height at the ends and at the center.	Construction	Per unit	20	15,000	3,00,000	DBO Contractor
5	Retro reflectorized Traffic Signs as per IRC:67, M 15 grade, 80 x 60 mm rectangular; fixed over	Construction	Per unit	6	2300	13,800	DBO Contractor

	Aluminum sheeting supported on MS angle iron.						
6	Retro reflectorized Traffic Signs as per IRC:67, M 15 grade, 60 x 60 mm square; fixed over Aluminum sheeting supported on MS angle iron.	Construction	Per unit	3	2000	6,000	DBO Contractor
	Sub Total (C)					8,19,800	
	Total (A+B+C)					18,04,000	

The air and noise quality monitoring will be done near to sensitive receptors like hospitals, educational institutions and major junctions.

PMU Fund - 2, 00,000
DBO Contractor Cost - 16,04,000
Total - 18,04,000

The total cost to implement EMP= Rs.18,04,000/-

X. FINDINGS AND RECOMMENDATIONS

A. Recommendation

187. The process described in this document has assessed the environmental impacts of all elements of the ByadgiSewerage project. All potential impacts were identified in relation to pre-construction, construction, and operation phases.

188. Planning principles and design considerations have been reviewed and incorporated into the site planning process whenever possible; thus, environmental impacts as being due to the project design or location were not significant. However, the social impacts (access disruptions) due to construction activities are unavoidable, as the residential and commercial establishments exist along the project corridor.

189. During the construction phase, impacts mainly arise from the need to dispose waste soil; and from the disturbance of residents, businesses, traffic and important buildings by the construction work. These are common impacts of construction in urban areas, and there are well developed methods for their mitigation. Since the sewer works are conducted along the roads, there is potential to create disturbance. To minimize this, the contractor should develop a Method Statement, which should be approved by the PIU prior to start of work, and should conduct the work strictly in line with the Method Statement.

190. Another major impact expected due to the proposed construction activities are deterioration of air and noise quality. These are minor impacts and temporary in nature. For reducing the impact due to noisy construction activities, specific measures including work scheduling and noise barriers are suggested in this report and should be followed strictly, especially near to the sensitive receptors. Proper planning in transportation of materials, damp down the exposed soil with water, removing the excavated soil and construction debris immediately after the work are recommended for controlling the air quality level.

191. The design of STP ensured proper technologies for reducing the odour and noise due to its operation. Sewage treatment process adopted is SBR, which is compact and efficient producing good quality effluent, and will have no notable impacts on surrounding areas or receiving water body. Similarly, the design of septic tank is as per the IndianStandard code, and includes a gravity filter for further treatment of septic tank effluent before it is disposed into nearby nallah.Proper lining and concreting recommended at STP

and Septic Tanks to avoid any chance for leakage and seepage and there by contamination of ground water. Therefore no significant impacts envisaged.

192. Green buffer zone around the treatment plant and declaring no-development zone, as recommended by the KSPCB/CPCB outside the STP area are included in this IEE to ensure reducing any possible disturbance to the public due to the bad odour or sound from the STP. Similarly for septic tank, a green buffer zone considered around the site with tree plantation.

193. There were limited opportunities to provide environmental enhancements, but certain measures were included. For example it is proposed that the project will employ in the workforce people who live in the vicinity of construction sites to provide them with a short-term economic gain; and ensure that people employed in the longer term to maintain and operate the new facilities are residents of nearby communities.

Proper operation and maintenance of STP through extended contract, development of O&M manual, and training and capacity building of ULB staff included in the project. Anticipated impacts during operation and maintenance of sewers will be related to detection and repair of leaks and pipe bursts. These are, likely to be minimal, as proper design and selection of good quality pipe material shall mean that leaks are minimal. However, the DBO contractor will prepare an O& M Plan and Emergency response Plan for the Sewer network and the STP, which will help to address any accidents, causalities or emergencies.

194. Mitigation will be assured by a program of environmental monitoring conducted during construction and operation to ensure that all measures are implemented, and to determine whether the environment is protected as intended. This will include observations on- and off-site, document checks, and interviews with workers and beneficiaries, and any requirements for remedial action will be reported to the PIU/RPMU. There will also be longer-term surveys to monitor the expected improvements in the quality of domestic water and the health of the population. There will also be regular and periodic monitoring surveys for quality of water (at intake, reservoirs and at consumer end).

195. 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.

196. 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.

197. The PMU will assist the RPMU, PMDCSC, 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 the implementing agency, project management unit, and contractors.

198. 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.

199. The citizens of the Byadgi town will be the major beneficiaries of this subproject. The sewerage system will remove the human waste from those areas served by the network rapidly and treated to an acceptable standard. Diseases of poor sanitation, such as diarrhoea 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. Adequate capacity of STP is included in the project.

XI. CONCLUSION

200. The ByadgiTownSewerage subproject is 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.

201. Based on the findings of the IEE, the classification of the Project as Category “B” is confirmed, and no further special study or detailed EIA needs to be undertaken to comply with ADB SPS (2009). Consent for establishment (CFE), which is a mandatory regulatory requirement, from KSPCB has already been obtained for the proposed STP including the diesel generator. STP is designed and will be operated as per the consent conditions.Septic Tank design is not yet initiated, andduring the detailed design, it will follow the design related measures suggested in this IEE and EMP.

Appendix 1. REA Checklist

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST
Byadgi Sewerage & STP Subproject

Country / Project Title:

IND: Karnataka Integrated Urban Water Management Investment Program Tranche 1 - Byadgi Town

Sector /Division: Sewage Treatment

A. Screening Questions for Impact Categorization

Check the appropriate box (e.g. ☒ by double-clicking the box and selecting 'checked' in default value)

Screening Questions	Yes/No	Remarks
A. Project Siting Is the project area…		
• Densely populated?	☒Yes ☐No	Subproject activities extend to the entire City including the densely populated areas. There are no major negative impacts envisaged, because sewer lines will be 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?	☒Yes ☐No	Byadgi is a developing town; urban expansion is considerable
• Adjacent to or within any environmentally sensitive areas?	☐Yes ☒No	None
• Cultural heritage site	☐Yes ☒No	None
• Protected Area	☐Yes ☒No	None
• Wetland	☐Yes ☒No	None
• Mangrove	☐Yes ☒No	None
• Estuarine	☐Yes ☒No	None
• Buffer zone of protected area	☐Yes ☒No	
• Special area for protecting biodiversity	☐Yes ☒No	None
• Bay	☐Yes ☒No	None
▪ impairment of historical/cultural monuments/areas and loss/damage to these sites?	☐ Yes ☒ No	There are no such areas near the subproject sites

▪ interference with other utilities and blocking of access to buildings; nuisance to neighbouring areas due to noise, smell, and influx of insects, rodents, etc.?	☐ Yes ☒ No	No blocking/interference with other utilities expected; subproject include sewer network and STP; necessary measures are included for smooth operation and maintenance
▪ dislocation or involuntary resettlement of people?	☐ Yes ☒ No	There may also be temporary disturbance to business and squatters/vendors during construction. Resettlement plan has prepared and to be followed
▪ impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?	☐ Yes ☒ No	Adequate sewage treatment capacity facility is being development under this subproject;
▪ overflows and flooding of neighbouring properties with raw sewage?	☐ Yes ☒ No	Sewerage system has been designed considering the population growth. It has been designed to accommodate sewage until year 2028. Design considers standard peak factors and therefore no such impact envisaged.
▪ environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?	☐ Yes ☒ No	Proper treatment facilities are provided and safe guard measures are recommended.
▪ noise and vibration due to blasting and other civil works?	☐ Yes ☒ No	No blasting activities envisaged. Temporary nuisance/disturbance due to construction activities will be minimized with appropriate mitigation measures.
▪ discharge of hazardous materials into sewers, resulting in damage to sewer system and danger to workers?	☐ Yes ☒ No	There are no sources of hazardous material that will find its way into the sewers. Wastewater other than municipal, i.e. industrial, entering the sewerage system must meet the stipulated standards, and therefore it is unlikely that problematic waste will be discharged into the sewers.
▪ Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances, and protect facilities?	☐ Yes ☒ No	Buffer zone planned in and around Sewage Treatment Plant.
▪ Social conflicts between construction workers from other areas and community workers	☐ Yes ☒ No	Provision added to employ at least 50% or maximum extent of people from the local project area.
▪ road blocking and temporary flooding due to land excavation during the rainy season?	☐ Yes ☒ No	All necessary precautions will be taken to prevent flooding during construction; flooding is unlikely as work will be mostly be conducted during dry season.
▪ noise and dust from construction activities?	☐ Yes ☒ No	No major noise generating activities like rock blasting is envisaged. Dust will be temporary and will be controlled with proper measures.
▪ traffic disturbances due to construction material transport and wastes?	☐ Yes ☒ No	Proper planning, such as selection of routes and scheduling to avoid peak traffic hours, will be carried out in consultation with concerned authorities
▪ temporary silt runoff due to construction?	☐ Yes ☒ No	Plain topography and moderate to low rains, so no such impact envisaged

▪ hazards to public health due to overflow flooding, and groundwater pollution due to failure of sewerage system?	☐ Yes ☒ No	A chance of failure of sewerage system is very remote; proper design and standard operating procedures will be followed in O&M; necessary equipment and training to workers will be provided
▪ deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water?	☐ Yes ☒ No	The STP design include adequate sludge treatment facilities
▪ contamination of surface and ground waters due to sludge disposal on land?	☐ Yes ☒ No	The WWTP design include adequate sludge treatment facilities and the dried sludge will be utilized as manure
▪ Health and safety hazards to workers from toxic gases and hazardous materials which may be contained in confined areas, sewage flow and exposure to pathogens in untreated sewage and unstabilized sludge?	☐ Yes ☒ No	All necessary health and safety training and necessary personal protection equipment will be given to workers and staff during operation of sewerage system

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: India/ Karnataka Integrated Urban Water Management Investment Program
Sector : Urban Development
Subsector: Waste water, Sewage treatment plant
Division/Department: Urban Development

Screening Questions		Score	Remarks[9]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.
Result of Initial Screening (Low, Medium, High):_Low_

Other Comments:_____

Prepared by:
Prepared by Karnataka Urban Infrastructure Development and Finance Corporation, Government of Karnataka

[9]If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Appendix 2 Consent For Establishment (CFE) for Byadgi STP

ಫ್ಯಾಕ್ಸ್ / Fax : 080-25586321
ಈಮೇಲ್ / E-mail : ho@kspcb.gov.in
ವೆಬ್‌ಸೈಟ್ / Website : http://kspcb.gov.in

☎ 25581383, 25589112
25588151, 25588270
25588142, 25586520

ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ
Karnataka State Pollution Control Board

"ಪರಿಸರಭವನ", 1 ರಿಂದ 5ನೇ ಮಹಡಿಗಳು, ನಂ.49, ಚರ್ಚ್‌ಸ್ಟ್ರೀಟ್, ಬೆಂಗಳೂರು - 560 001, ಕರ್ನಾಟಕ, ಭಾರತ
"Parisara Bhavana", 1st to 5th Floor, # 49, Church Street, Bengaluru - 560 001, Karnataka, INDIA

0895 1

//BY REGD. POST WITH ACKDUE//

(This document contains 04 pages including annexure)

No. PCB/82/WMC/STP/2016/ | 3B 437 Dated: 12 JUL 2016

To,
The Chief Officer
Town Municipal Council
Byadagi

Sub: Issue of the Consent for Establishment of STP in respect of TMC, Byadagi- reg.
Ref: 1. Consent application filed by you under the Water & Air Acts dated: 12.04.2016.
2. Inspection of the Sewage Treatment Plant (STP) by RO, Haveri on 12.04.2016.
3. Proceedings of CCM held on 10.06.2016

**** ***

With reference to the above, it is to be informed that, the Board hereby accords Consent for Establishment under the Water (Prevention & Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 for establishing a Sewage Treatment Plant (STP) of capacity 5 MLD at Sy. No. 64, 65, 66, 67 & 68, Teradahalli, Byadagi Taluk, Haveri District subject to the following conditions;

1. This consent for establishment is valid for a period of **five years** from the date of issue.
2. The applicant shall not undertake expansion/diversification without the prior consent of the Board.
3. The applicant shall obtain necessary license/clearance from other relevant statutory agencies before taking up construction.

I. SPECIFIC CONDITIONS:

1. The TMC shall provide UGD facility for the entire Town Municipal Council, and report to the Board.
2. The TMC shall maintain 100 mts buffer zone around the Sewage Treatment Plant area.
3. The responsibility to execute, commission, operation and maintenance of the STP will be taken by TMC authorities only.
4. The consent is issued without prejudice to the Court Cases pending in any Hon'ble Court.
5. The TMC shall pay balance cess under The Water (Prevention and Control of Pollution) Cess Act, 1977 within three months.

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II. WATER POLLUTION CONTROL SYSTEM:

1. The treatment plant shall be used for the treatment of sewage only, at any point of time.
2. The TMC shall treat the sewage in the STP as per the proposals submitted to the Board. The TMC shall provide the STP as follows,

Sl. No.	STP Units	Dimensions in meters
1	Stilling Chamber (1No.)	1.50m x 1.50m x 2.00m
2	Fine screen channel: Mechanical (1 No.)	6.5m x 0.65m x 0.65m
3	Fine screen channel: Manual (1 No.)	6.5m x 0.65m x 0.65m
4	Grit chamber (mechanical) (2 No's)	4.0m x 4.0m x 0.90m
5	SBR basins (2 No's)	26.50m x 13.25m x 6.5m
6	Chlorination tank (1 No's)	10.0m x 6.0m x 4.0m
7	Sludge Sump(1 No's)	6.0m x 4.0m x 3.50m
8	Polyelectrolyte dosing tank(1 No's)	1m x1.0m x 1.5m
9	Centrate sump (1 No's)	3.0m x 3.0m x 3.0m

Sl. No.	Building	Dimensions in meters
1	HT Substation (1 No's)	10.0m x 10.0m x 4.0m
2	DG Set house (1 No's)	10.0m x 5.0m x 6.0m
3	SBR Air Blower cum Admin cum MCC Control building (G+1) (1 No's)	15.0m x 10.0m x 8.0m
4	Chlorination cum Chlorine tonner house (above Chlorination tank) (1 No's)	6.0m x 5.0m x 6.0m
5	Centrifugal house (1 No's)	7.0m x 6.0m x 8.0m
6	Security cabin (1 No's)	3.0m x 3.0m x 3.0m

3. The TMC shall treat the sewage to the standards stipulated in **Annexure-I** and after treatment utilize the treated sewage for irrigation purpose.
4. All the treatment units shall be made totally impervious.
5. The TMC is liable to reinstate/ restore, damaged or destroyed elements of environment at its cost, failing which the applicant/ occupier as the case may be/shall be liable to pay the entire cost of remediation or restoration and pay in advance an amount equal to the cost estimated by competent agency or committee.
6. The TMC shall take adequate measures to avoid any entry of treated/untreated sewage into nearby nalla.
7. The separate flow meter shall be installed to record hourly inflow & outflow of domestic effluent into the STP and maintain logbooks for hourly recording for verification of inspecting officers.
8. The TMC shall ensure that, there shall not be any odour nuisance in the surrounding area due to the operation of the STP. Sufficient green belt shall be developed around the STP site.
9. The applicant shall install the DG set with the prior permission of the board for continuous operation of STP during the power failure.

III. AIR POLLUTION CONTROL SYSTEM:

There shall be DG Sets of 250 KVA as an alternative power supply for STP, for pollution control measures are stipulated in the Annexure-II.

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IV. SOLID WASTE (OTHER THAN HAZARDOUS WASTE) DISPOSAL:

The solid wastes collected in the treatment plant premises in the form of general garbage shall be disposed off scientifically to the satisfaction of the Board so as not to cause fugitive emissions, dust problems or water pollution through leaching etc., of any kind.

V. GENERAL CONDITIONS:

1. The authority shall immediately report to the Board, of any accident or unforeseen act or event resulting in release of discharge of effluents or emissions or solid wastes, etc., in excess of the standards stipulated and the authorities shall immediately take appropriate corrective and preventive actions under intimation.
2. Exact date of commissioning of the Sewage Treatment Plant shall be informed to this Board 45 days in advance so as to make necessary inspection of the plant and the pollution control measures provided by the authorities.
3. The applicant shall comply with all the rules and guidelines issued from time to time.
4. The Board reserves right to review and impose additional condition or conditions, revoke, change or alter the terms and conditions
5. This CFE does not give any right to the Party/Project Authority/Industry to forego any requirement that is necessary for starting operation of the plant.
6. The TMC shall furnish point-wise compliance to the conditions given under Consent for Establishment within 30days.

Please note that, this is only Extension of Consent for Establishment issued to you to proceed with establishment of Sewage Treatment Plant and does not give right for proceeding with operation of the said plant. For the purpose of the operation after establishment, a separate Consent of the Board for discharge of domestic effluent and emissions to the air shall have to be obtained by filing prescribed consent applications along with consent fees under the Water (Prevention & Control of Pollution) Act, 1974. The application for consent has to be made 45 days in advance to commissioning for trial of Sewage Treatment Plant.

The receipt of this letter may please be acknowledged.
Encl.: Annexure-I & II

For and on behalf of
Karnataka State Pollution Control Board
Sd/-
SENIOR ENVIRONMENTAL OFFICER

Copy to:

1) The Regional Senior Environmental Officer, Dharwad for information and to inspect the site of STP location during your next visit to the area.
2) The Regional Officer, Haveri for information and to inspect the site of STP location during your next visit to the area.
3) Case file.
4) Master file (Help desk)
5) Master file

ENVIRONMENTAL OFFICER

ANNEXURE-I

ON LAND FOR IRRIGATION

Sl No	Parameters	Parameters Limit(Standards for new STPs Design after notification date)
1	pH	5.5-9.0
2	Bio-chemical Oxygen Demand, mg/l. (3 days at 27^0 C max)	Not more than 10
3	Chemical Oxygen demand (mg/l)	Not more than 50
4	Total suspended solid (mg/l)	Not more than 20
5	NH4-N(mg/l)	Not more than 5
6	N-Total (mg/l)	Not more than 10
7	Faecal Coliform(MPN/100ml)	Less than 100

Note: All efforts should be made to remove colour and unpleasant odour as far as practicable.

HYDRAULIC LOADING APPLICABLE FOR DIFFERENT SOILS

Sl. No.	Soil Texture	Loading rate in m^3 /hec/day
1	Sandy	225 to 280
2	Sandy Loam	170 to 225
3	Loam	110 to 170
4	Clay Loam	055 to 110
5	Clayey	035 to 055

ANNEXURE – II

Sl No	Chimney Attached to	Mininum Chimney Height to be Provided	Air Pollution Control equipment to be installed.	Remarks
1	250 KVA DG Set	5m AGL	Acoustic Enclosure	1) The emission rate of all chimneys shall be reported within 30 days. 2) Details of D.G. Sets if any like KVA rating fuel consumption in Kg/hr, Chimney height above roof level and dia to be furnished within 30 days. D.G. Sets and other noise generating machinery to be provided with silencers/Mufflers to reduce the noise pollution. 3) There shall be no smell or odour nuisance from the industry. 4) There shall be no other sources of air pollution.

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Appendix 3National 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 PM_{10} $\mu g/m^3$	Annual 24 hours	60 100	60 100	Gravimetric -TOEM -Beta attenuation
4	Particulate Matter (Size less than 2.5 µm) or $PM_{2.5}$ $\mu g/m^3$	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 4Applicable Noise Standards

Area code	Category of area/zone	Limit in dB (A)	
		Day time	Night time
1	Industrial area	75	70
2	Commercial area	65	55
3	Residential area	55	45
4	Silence zone	50	40

Appendix 5Salient Features of Major Labor Laws

Including Amendments Issued From Time To Time 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 6. Sale Deed and Registration Letters for the Private Land for STP

Registration of approach road: Krishnappa

ಎರಡು ಸಾವಿರದಾ ಹದಿನೈದನೇ ಇಸವಿ, ಮಾರ್ಚ್ ತಿಂಗಳು, ಮೂರನೇ ದಿನಾಂಕದಂದು ಹಾವೇರಿ ಜಿಲ್ಲಾ ಬ್ಯಾಡಗಿ ತಾಲೂಕ ಬ್ಯಾಡಗಿ ಹೋಬಳಿಗೆ ಸೇರಿದ, ತರೇದಹಳ್ಳಿ ಗ್ರಾಮದ ಖುಷ್ಕಿ ಮಸಾರಿ ಜಮೀನಿನ ದಕ್ಕ ಖರೀದಿ ಪತ್ರ ₹. 2,16,562/- [ರೂ. ಎರಡು ಲಕ್ಷ ಹದಿನಾರು ಸಾವಿರದಾ ಐದನೂರಾ ಅರವತ್ತೆರಡು]ಗಳು ಮಾತ್ರ.

ಮಾನ್ಯ ಘನವೆತ್ತ ರಾಜ್ಯಪಾಲರು, ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸರಕಾರ, ಬೆಂಗಳೂರು ಇವರ ಪರವಾಗಿ, ಮುಖ್ಯಾಧಿಕಾರಿಗಳು ಪುರಸಭೆ ಬ್ಯಾಡಗಿ, ತಾಲೂಕ ಬ್ಯಾಡಗಿ, ಜಿಲ್ಲಾ ಹಾವೇರಿ ಇವರಿಗೆ.

ದಕ್ಕ ಖರೀದಿ ಪತ್ರ ಬೇಸ್ಮಿ :- **ಶ್ರೀ ಕೃಷ್ಣಪ್ಪ ಬಿನ್ ಶಿದ್ದಪ್ಪ ಹುಬ್ಬಳ್ಳಿ,** IDENTITY CARD No.KT/23/184/147208 ವಯಸ್ಸು 74, ಉದ್ಯೋಗ ವ್ಯವಸಾಯ, ವಿಳಾಸ:-ಬನಶಂಕರಿ ಗುಡಿ ರಸ್ತೆ ಬ್ಯಾಡಗಿ, ತಾಲೂಕ ಬ್ಯಾಡಗಿ, ಜಿಲ್ಲಾ ಹಾವೇರಿ. ನಾನು ಬರೆಯಿಸಿಕೊಡುವ ದಕ್ಕ ಖರೀದಿ ಪತ್ರ ಏನಂದರೆ,

ಶೆಡ್ಯೂಲದಲ್ಲಿ ಕಾಣಿಸಿದ ಜಮೀನು ನನ್ನ ಸ್ವ ಸಂಪಾದಿತ ಜಮೀನು ಇದ್ದು, ಇದು ನನಗೆ ಖರೀದಿ ಪ್ರಕಾರ ಬಂದ ಜಮೀನು ಇರುತ್ತದೆ. ಸದರ ಜಮೀನಿನ ಬಗ್ಗೆ ನಾನು ಸರಕಾರಕ್ಕೆ ವ ಇತರೆ ಸಂಘ ಸಂಸ್ಥೆಗಳಿಗೆ ಕಟ್ಟುತಕ್ಕ ಕರ ಕಂದಾಯಗಳನ್ನು ಕಟ್ಟಿ, ಸದರ ಜಮೀನನ್ನು ಇಂದಿಗೂ ನನ್ನ ಪ್ರತ್ಯಕ್ಷ ಕಬ್ಜಾದಲ್ಲಿ ಇಟ್ಟುಕೊಂಡಿರುತ್ತೇನೆ. ಸದರ ಜಮೀನು ಗ್ರಾಮದಿಂದ ಒಂದು ಕಿ.ಮೀ ದೂರ ಇರುತ್ತದೆ. ಈ ಜಮೀನಿಗೆ ದಾರಿ ಸೌಕರ್ಯ ಇರುತ್ತದೆ. ಸದರ ಜಮೀನು ಖುಷ್ಕಿ ಮಸಾರಿ ಜಮೀನು ಇದ್ದು, ಇದರಲ್ಲಿ ಹತ್ತಿ, ಗೋವಿನಜೋಳ ವಗೈರೆ ಬೆಳೆ ಬೆಳೆಯುತ್ತವೆ. ಸದರ ಜಮೀನನ್ನು ದಕ್ಕ ಖರೀದಿಗೆ ಕೊಡಲು ಕಾರಣವೇನೆಂದರೆ,

ಒಳಚರಂಡಿ ನೀರು ಶುದ್ಧೀಕರಣ ಘಟಕಕ್ಕೆ ಸಂಪರ್ಕ ಕಲ್ಪಿಸುವ ರಸ್ತೆಗಾಗಿ ನೀವು

Print Date & Time : 03-03-2015 02:08:44 PM

ದಾಖಲೆಯ ಸಂಖ್ಯೆ : 3161

ಸೆಂ ರಜಿಸ್ಟ್ರಾರ ಬ್ಯಾಡಗಿ ರವರ ಕಚೇರಿಯಲ್ಲಿ ದಿನಾಂಕ 03-03-2015 ರಂದು 02:02:56 PM ಗಂಟೆಗೆ ಈ ಕೆಳಗೆ ವಿವರಿಸಿದ ಶುಲ್ಕವನ್ನು

ಕ್ರಮ ಸಂಖ್ಯೆ	ವಿವರ	ರೂ. ಪೈ
1	ಸ್ಟ್ಯಾಂಪಿಂಗ್ ಫೀ	350.00
2	ಪರಿಪಾಲನಾ ಶುಲ್ಕ	35.00
3	ಪರಿಶೋಧನಾ ಶುಲ್ಕ	35.00
	ಒಟ್ಟು :	420.00

ಶ್ರೀ ಮಾನ್ಯ ಘನವೆತ್ತ ರಾಜ್ಯಪಾಲರು ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸರಕಾರ ಬೆಂಗಳೂರ ಇವರ ಪರವಾಗಿ ಮುಖ್ಯಾಧಿಕಾರಿಗಳು ಪುರಸಭೆ ಬ್ಯಾಡಗಿ ಇವರಿಂದ ಹಾಜರ ಮಾಡಲ್ಪಟ್ಟ ದೆ

ಹೆಸರು	ಫೋಟೊ	ಹೆಬ್ಬೆಟ್ಟಿನ ಗುರುತು	ಸಹಿ
ಶ್ರೀ ಮಾನ್ಯ ಘನವೆತ್ತ ರಾಜ್ಯಪಾಲರು ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸರಕಾರ ಬೆಂಗಳೂರ ಇವರ ಪರವಾಗಿ ಮುಖ್ಯಾಧಿಕಾರಿಗಳು ಪುರಸಭೆ ಬ್ಯಾಡಗಿ.			ಮುಖ್ಯಾಧಿಕಾರಿ ಪುರಸಭೆ, ಬ್ಯಾಡಗಿ.

ಅಪ ನೋಂದಣಾಧಿಕಾರಿಗಳು ಬ್ಯಾಡಗಿ.

ಬರೆಯಿಸಿಕೊಟ್ಟವರ್ಗಾಗಿ ಒಪ್ಪಿರುತ್ತಾರೆ

ಕ್ರಮ ಸಂಖ್ಯೆ	ಹೆಸರು	ಫೋಟೊ	ಹೆಬ್ಬೆಟ್ಟಿನ ಗುರುತು	ಸಹಿ
1	ಮಾನ್ಯ ಘನವೆತ್ತ ರಾಜ್ಯಪಾಲರು ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸರಕಾರ ಬೆಂಗಳೂರ ಇವರ ಪರವಾಗಿ ಮುಖ್ಯಾಧಿಕಾರಿಗಳು ಪುರಸಭೆ ಬ್ಯಾಡಗಿ . (ಬರೆಸಿಕೊಂಡವರು)			ಮುಖ್ಯಾಧಿಕಾರಿ ಪುರಸಭೆ, ಬ್ಯಾಡಗಿ.
2	ಹುಬ್ಬಳ್ಳಿ ಕೃಷ್ಣಪ್ಪ ಮಿನ್ ಶಿರ್ಡಪ್ಪ (ಬರೆಯಿಸಿಕೊಂಡವರು)			

ಅಪ ನೋಂದಣಾಧಿಕಾರಿಗಳು ಬ್ಯಾಡಗಿ.

3161/14-15

ನನ್ನ ಜಮೀನನ್ನು ಕೇಳಿದ್ದರಿಂದ ಜಮೀನು ಕೊಡಲು ನಾನು ಒಪ್ಪಿ, ನೀವು ನಿಗದಿಪಡಿಸಿದ ಮಾರುಕಟ್ಟೆ ಬೆಲೆಯಾದ ₹. 2,16,562/– [ರೂ. ಎರಡು ಲಕ್ಷ ಹದಿನಾರು ಸಾವಿರದಾ ಐದನೂರಾ ಅರವತ್ತೆರಡು]ಗಳಿಗೆ ಖರೀದಿಗೆ ಕೊಡಲು ನಾನು ಒಪ್ಪಿ, ನಿಮ್ಮ ಪುರಸಭೆಗೆ ಖರೀದಿಗೆ ಕೊಟ್ಟಿರುತ್ತೇನೆ. ಖರೀದಿ ಬಾಬತ್ತು ಇಂದೇ ನೀವು ನನ್ನ ಹೆಸರಿಗೆ ಕೊಟ್ಟ ₹. 2,16,562/– [ರೂ. ಎರಡು ಲಕ್ಷ ಹದಿನಾರು ಸಾವಿರದಾ ಐದನೂರಾ ಅರವತ್ತೆರಡು]ಗಳ ಸ್ಟೇಟ ಬ್ಯಾಂಕ ಆಫ್ ಮೈಸೂರ ಶಾಖೆ ಬ್ಯಾಡಗಿ ಈ ಬ್ಯಾಂಕಿನ ಚೆಕ್ಕ ನಂಬರ 165940 ನೇದ್ದರ ಮುಖಾಂತರ ಪೂರಾ ಹಣ ಈ ಖರೀದಿ ಪತ್ರಕ್ಕೆ ಸಾಕ್ಷಿ ಸಹಿ ಹಾಕಿದವರ ಸಮಕ್ಷಮ ಮುಟ್ಟಿರುತ್ತವೆ. ಖರೀದಿ ಬಾಬತ್ತು ಬರತಕ್ಕ ಬಾಕಿ ಹಣ ಏನೂ ಇರುವುದಿಲ್ಲ. ಸದರ ಜಮೀನನ್ನು ಇಂದೇ ನಿಮ್ಮ ಪುರಸಭೆಯ ಪ್ರತ್ಯಕ್ಷ ಕಬ್ಜಾಕ್ಕೆ ಕೊಟ್ಟಿದ್ದೇನೆ. ಇಂದಿನಿಂದ ಸದರ ಜಮೀನಿನ ಮೇಲೆ ನನ್ನ ವ ನನ್ನ ವಾರಸಾದಾರರ ವಾರಸಾ ಮಾಲ್ಕಿ ಹಕ್ಕು ಹಿತಾ ಸಂಬಂಧ ವಗೈರೆ ಏನೂ ಇರುವುದಿಲ್ಲ. ಸಂಪೂರ್ಣ ಮಾಲ್ಕಿ ಹಕ್ಕು ನಿಮ್ಮ ಪುರಸಭೆಯದೇ ಇರುತ್ತದೆ. ಸದರ ಆಸ್ತಿಯನ್ನು ನೀವು ಸರಕಾರದ ಆದೇಶದ ಪ್ರಕಾರ ವಹಿವಾಟು ಉಪಭೋಗ ಮಾಡಿಕೊಳ್ಳತಕ್ಕದ್ದು. ಇಂದಿನಿಂದ ಇದರಲ್ಲಿಯ ಯಾವತ್ತೂ ಫಾಯದೇ೦ರ ಹಕ್ಕುಗಳಿಗೆ ನಿಮ್ಮ ಪುರಸಭೆಯ ಮಾಲೀಕತ್ವ ವ ಹಕ್ಕುದಾರತ್ವ ಇರುತ್ತದೆ. ಈ ಖರೀದಿ ವ್ಯವಹಾರವು ಸರಕಾರದ ಸುತ್ತೋಲೆ ಸಂಖ್ಯೆ : ಕಂ.ಇ. 344 ಮು.ನೋ.ಮು.2008 ದಿನಾಂಕ:–06–4–2009 ನೇದ್ದರಲ್ಲಿಯ ರಾಜ್ಯ/ಕೇಂದ್ರ ಶಾಸನಗಳ ಉಪಬಂಧಗಳನ್ನು ಉಲ್ಲಂಘಿಸಿರುವುದಿಲ್ಲ. ಸದರ ಜಮೀನನ್ನು ನಾನು ಈ ಮೊದಲು ಬೇರೆ ಯಾರಿಗೂ ಯಾವುದೇ ತರಹದ ಹಸ್ತಾಂತರ ಮಾಡಿಲ್ಲ. ಅಲ್ಲದೇ ಈ ಜಮೀನಿನ ಮೇಲೆ ಯಾವುದೇ ಸಾಲದ ಭೋಜಾ ಇರುವುದಿಲ್ಲ. ಈ ಜಮೀನಿನ ಬಗ್ಗೆ ಯಾವುದೇ ನ್ಯಾಯಾಲಯಗಳಲ್ಲಿ ವ್ಯಾಜ್ಯಗಳು ಇರುವುದಿಲ್ಲ.

ಕ್ರಮ ಸಂಖ್ಯೆ	ಹೆಸರು ಮತ್ತು ವಿಳಾಸ	ಸಹಿ
1	ಗಿರೀಶಗೌಡ ತಿ. ಪಾಟೀಲ ಬ್ಯಾಡಗಿ	
2	ಮಂಜುನಾಥ. ಫಕ್ಕೀರಪ್ಪ ಶೆಟ್ಟಿ ಹಲಗೇರಿ	

ಉಪ ನೋಂದಣಿ ಅಧಿಕಾರಿ
ಬ್ಯಾಡಗಿ

1 ನೇ ಪುಸ್ತಕದ ದಸ್ತಾವೇಜು
ನಂಬರ BYD-1-03161-2014-15 ಆಗಿ
ಸಿ.ಡಿ. ನಂಬರ BYDD63 ನೇ ದ್ದರಲ್ಲಿ
ದಿನಾಂಕ 03-03-2015 ರಂದು ನೋಂದಾಯಿಸಲಾಗಿದೆ

ಉಪ ನೋಂದಣಿ ಅಧಿಕಾರಿ
ಬ್ಯಾಡಗಿ

3 MAR 2015

Designed and Developed by C-DAC, ACTS, Pune

The Seal of the Sub-Registrar
BYADAGI

Registration of Approach Road: Mudukappa

2160/14-15

ಎರಡು ಸಾವಿರದ ಹದಿನೈದನೇ ಇಸವಿ, ಮಾರ್ಚ ತಿಂಗಳು, ಮೂರನೇ ದಿನಾಂಕದಂದು ಹಾವೇರಿ ಜಿಲ್ಲಾ ಬ್ಯಾಡಗಿ ತಾಲೂಕ ಬ್ಯಾಡಗಿ ಹೋಬಳಿಗೆ ಸೇರಿದ, ತರೇದಹಳ್ಳಿ ಗ್ರಾಮದ ಖುಷ್ಕಿ ಯಿರಿ ಹಾಗೂ ಮಸಾರಿ ಮಡಿಕಟ್ಟು ಜಮೀನುಗಳ ದಕ್ಕ ಖರೀದಿ ಪತ್ರ ₹. 1,21,170/- [ರೂ. ಒಂದು ಲಕ್ಷ ಇಪ್ಪತ್ತೊಂದು ಸಾವಿರದ ಒಂದನೂರಾ ಎಪ್ಪತ್ತು]ಗಳು ಮಾತ್ರ.

ಮಾನ್ಯ ಘನವೆತ್ತ ರಾಜ್ಯಪಾಲರು, ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸರಕಾರ, ಬೆಂಗಳೂರು ಇವರ ಪರವಾಗಿ, ಮುಖ್ಯಾಧಿಕಾರಿಗಳು ಪುರಸಭೆ ಬ್ಯಾಡಗಿ, ತಾಲೂಕ ಬ್ಯಾಡಗಿ, ಜಿಲ್ಲಾ ಹಾವೇರಿ ಇವರಿಗೆ.

ದಕ್ಕ ಖರೀದಿ ಪತ್ರ ಬೇಸ್ಕ :- **ಶ್ರೀ ಮುದಕಪ್ಪ ಬಿನ್ ಬಸಪ್ಪ ಕೊಪ್ಪದ**, IDENTITY CARD No KT/23/184/168309 ವಯಸ್ಸು 76, ಉದ್ಯೋಗ ವ್ಯವಸಾಯ, ವಿಳಾಸ:-ತಳವೇಟಿ ಓಣಿ ಬ್ಯಾಡಗಿ, ತಾಲೂಕ ಬ್ಯಾಡಗಿ, ಜಿಲ್ಲಾ ಹಾವೇರಿ. ನಾನು ಬರೆಯಿಸಿಕೊಡುವ ದಕ್ಕ ಖರೀದಿ ಪತ್ರ ವಿನಂದರೆ,

ಕೆಡ್ಯೂಲದಲ್ಲಿ ಕಾಣಿಸಿದ ಜಮೀನುಗಳು ಪಿತ್ರಾರ್ಜಿತ ಜಮೀನುಗಳು ಇದ್ದು, ಇವುಗಳು ನನಗೆ ವಾರಸಾ ವ ವಾಟ್ಣಿ ಪ್ರಕಾರ ಬಂದ ಜಮೀನುಗಳು ಇರುತ್ತವೆ. ಸದರ ಜಮೀನುಗಳ ಬಗ್ಗೆ ನಾನು ಸರಕಾರಕ್ಕೆ ವ ಇತರೆ ಸಂಘ ಸಂಸ್ಥೆಗಳಿಗೆ ಕಟ್ಟಬಕ್ಕ ಕರ ಕಂದಾಯಗಳನ್ನು ಕಟ್ಟಿ, ಸದರ ಜಮೀನುಗಳನ್ನು ಇಂದಿಗೂ ನನ್ನ ಪ್ರತ್ಯಕ್ಷ ಕಬ್ಜಾದಲ್ಲಿ ಇಟ್ಟುಕೊಂಡಿರುತ್ತೇನೆ. ಸದರ ಜಮೀನುಗಳು ಗ್ರಾಮದಿಂದ ಒಂದು ಕಿ.ಮೀ ದೂರ ಇರುತ್ತವೆ. ಇವುಗಳಿಗೆ ದಾರಿ ಸೌಕರ್ಯ ಇರುತ್ತದೆ. ಈ ಜಮೀನುಗಳಿಗೆ ಯಾವುದೇ ನೀರಾವರಿ ಸೌಕರ್ಯ ಇರುವದಿಲ್ಲ. ಸದರ ಜಮೀನುಗಳು ಖುಷ್ಕಿ ಯಿರಿ ಹಾಗೂ ಮಸಾರಿ ಮಡಿಕಟ್ಟು ಜಮೀನುಗಳು ಇದ್ದು, ಇವುಗಳಲ್ಲಿ ಉದ್ದು, ಹೆಸರು, ಹತ್ತಿ, ಗೋವಿನಜೋಳ, ಬಳಜೋಳ ವಗೈರೆ ಬೆಳೆ ಬೆಳೆಯುತ್ತವೆ. ಸದರ ಜಮೀನುಗಳನ್ನು ದಕ್ಕ ಖರೀದಿಗೆ ಕೊಡಲು ಕಾರಣವೇನೆಂದರೆ,

ಒಳಚರಂಡಿ ನೀರು ಶುದ್ಧೀಕರಣ ಘಟಕಕ್ಕೆ ಸಂಪರ್ಕ ಕಲ್ಪಿಸುವ ರಸ್ತೆಗಾಗಿ ನೀವು

Print Date & Time : 03-03-2015 01:57:51 PM

ದಸ್ತಾವೇಜು ಸಂಖ್ಯೆ : 3160

ಸಬ್ ರಿಜಿಸ್ಟ್ರಾರ ಬ್ಯಾಡಗಿ ರವರ ಕಚೇರಿಯಲ್ಲಿ ದಿನಾಂಕ 03-03-2015 ರಂದು 01:50:44 PM ಗಂಟೆಗೆ ಈ ಕೆಳಗೆ ವಿವರಿಸಿದ ಶುಲ್ಕವಿಂದಿಗೆ

ಕ್ರಮ ಸಂಖ್ಯೆ	ವಿವರ	ರೂ. ಪೈ
1	ಸ್ಕ್ಯಾನಿಂಗ್ ಫೀ	350.00
2	ಪರಿವೀಕ್ಷಣಾ ಶುಲ್ಕ	70.00
3	ಪರಿಷ್ಕರಣಾ ಶುಲ್ಕ	35.00
	ಒಟ್ಟು :	455.00

ಶ್ರೀ ಮಾನ್ಯ ಘನವೆತ್ತ ರಾಜ್ಯಪಾಲರು ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸರಕಾರ ಬೆಂಗಳೂರ ಇವರ ಪರವಾಗಿ ಮುಖ್ಯಾಧಿಕಾರಿಗಳು ಪುರಸಭೆ ಬ್ಯಾಡಗಿ ಇವರಿಂದ ಕಾವೇರಿ ಮಾಡಲ್ಪಟ್ಟ ದೆ

ಹೆಸರು	ಫೋಟೊ	ಹೆಬ್ಬೆಟ್ಟಿನ ಗುರುತು	ಸಹಿ
ಶ್ರೀ ಮಾನ್ಯ ಘನವೆತ್ತ ರಾಜ್ಯಪಾಲರು ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸರಕಾರ ಬೆಂಗಳೂರ ಇವರ ಪರವಾಗಿ ಮುಖ್ಯಾಧಿಕಾರಿಗಳು ಪುರಸಭೆ ಬ್ಯಾಡಗಿ			ಮುಖ್ಯಾಧಿಕಾರಿ ಪುರಸಭೆ. ಬ್ಯಾಡಗಿ.

ಉಪ ನೋಂದಣಾಧಿಕಾರಿ
ಬ್ಯಾಡಗಿ.

ಬರೆದುಕೊಟ್ಟವರಾಗಿ ಒಪ್ಪಿರುತ್ತಾರೆ

ಕ್ರಮ ಸಂಖ್ಯೆ	ಹೆಸರು	ಫೋಟೊ	ಹೆಬ್ಬೆಟ್ಟಿನ ಗುರುತು	ಸಹಿ
1	ಮಾನ್ಯ ಘನವೆತ್ತ ರಾಜ್ಯಪಾಲರು ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸರಕಾರ ಬೆಂಗಳೂರ ಇವರ ಪರವಾಗಿ ಮುಖ್ಯಾಧಿಕಾರಿಗಳು ಪುರಸಭೆ ಬ್ಯಾಡಗಿ . (ಬರೆಸಿಕೊಂಡವರು)			ಮುಖ್ಯಾಧಿಕಾರಿ ಪುರಸಭೆ. ಬ್ಯಾಡಗಿ.
2	ಕೊಪ್ಪದ ಮಾರಪ್ಪ ಬಿನ್ ಬಾಪ್ಪ (ಬರೆದುಕೊಟ್ಟವರು)			ಮಾರಪ್ಪ

ಉಪ ನೋಂದಣಾಧಿಕಾರಿ
ಬ್ಯಾಡಗಿ.

3160/14-15

ನನ್ನ ಜಮೀನನ್ನು ಕೇಳಿದ್ದರಿಂದ ಜಮೀನು ಕೊಡಲು ನಾನು ಒಪ್ಪಿ, ನೀವು ನಿಗದಿಪಡಿಸಿದ ಮಾರುಕಟ್ಟೆ ಬೆಲೆಯಾದ ₹. 1,21,170/- [ರೂ. ಒಂದು ಲಕ್ಷ ಇಪ್ಪತ್ತೊಂದು ಸಾವಿರದಾ ಒಂದನೂರಾ ಎಪ್ಪತ್ತು]ಗಳಿಗೆ ಖರೀದಿಗೆ ಕೊಡಲು ನಾನು ಒಪ್ಪಿ, ನಿಮ್ಮ ಪುರಸಭೆಗೆ ಖರೀದಿಗೆ ಕೊಟ್ಟಿರುತ್ತೇನೆ. ಖರೀದಿ ಬಾಬತ್ತು ಇಂದೇ ನೀವು ನನ್ನ ಹೆಸರಿಗೆ ಕೊಟ್ಟ ₹. 1,21,170/- [ರೂ. ಎರಡು ಲಕ್ಷ ತೊಂಬತ್ತೂರು ಸಾವಿರ]ಗಳ ಸ್ಟೇಟ್ ಬ್ಯಾಂಕ್ ಆಫ್ ಮೈಸೂರ ಶಾಖೆ ಬ್ಯಾಡಗಿ ಈ ಬ್ಯಾಂಕಿನ ಚೆಕ್ಕ ನಂಬರ 165137 ನೇದ್ದರ ಮುಖಾಂತರ ಪೂರಾ ಹಣ ಈ ಖರೀದಿ ಪತ್ರಕ್ಕೆ ಸಾಕ್ಷಿ ಸಹಿ ಹಾಕಿದವರ ಸಮಕ್ಷಮ ಮುಟ್ಟಿರುತ್ತವೆ. ಖರೀದಿ ಬಾಬತ್ತು ಬರತಕ್ಕ ಬಾಕಿ ಹಣ ಏನೂ ಇರುವುದಿಲ್ಲ. ಸದರ ಜಮೀನುಗಳನ್ನು ಇಂದೇ ನಿಮ್ಮ ಪುರಸಭೆಯ ಪ್ರತ್ಯಕ್ಷ ಕಬ್ಜಾಕ್ಕೆ ಕೊಟ್ಟಿದ್ದೇನೆ. ಇಂದಿನಿಂದ ಸದರ ಜಮೀನುಗಳ ಮೇಲೆ ನನ್ನ ವ ನನ್ನ ವಾರಸಾದಾರರ ವಾರಸಾ ಮಾಲ್ಕಿ ಹಕ್ಕು ಹಿತಾ ಸಂಬಂಧ ವಗೈರೆ ಏನೂ ಇರುವುದಿಲ್ಲ. ಸಂಪೂರ್ಣ ಮಾಲ್ಕಿ ಹಕ್ಕು ನಿಮ್ಮ ಪುರಸಭೆಯದೇ ಇರುತ್ತದೆ. ಸದರ ಆಸ್ತಿಯನ್ನು ನೀವು ಸರಕಾರದ ಆದೇಶದ ಪ್ರಕಾರ ವಹಿವಾಟು ಉಪಭೋಗ ಮಾಡಿಕೊಳ್ಳತಕ್ಕದ್ದು. ಇಂದಿನಿಂದ ಇದರಲ್ಲಿಯ ಯಾವತ್ತೂ ಫಾಯದೇಶೀರ ಹಕ್ಕುಗಳಿಗೆ ನಿಮ್ಮ ಪುರಸಭೆಯ ಮಾಲೀಕತ್ವ ವ ಹಕ್ಕುದಾರತ್ವ ಇರುತ್ತದೆ. ಈ ಖರೀದಿ ವ್ಯವಹಾರವು ಸರಕಾರದ ಸುತ್ತೋಲೆ ಸಂಖ್ಯೆ : ಕಂ.ಇ. 344 ಮು.ನೋ.ಮು.2008 ದಿನಾಂಕ:-06-4-2009 ನೇದ್ದರಲ್ಲಿಯ ರಾಜ್ಯ/ಕೇಂದ್ರ ಶಾಸನಗಳ ಉಪಬಂಧಗಳನ್ನು ಉಲ್ಲಂಘಿಸಿರುವುದಿಲ್ಲ. ಸದರ ಜಮೀನುಗಳನ್ನು ನಾನು ಈ ಮೊದಲು ಬೇರೆ ಯಾರಿಗೂ ಯಾವುದೇ ತರಹದ ಹಸ್ತಾಂತರ ಮಾಡಿಲ್ಲ. ಅಲ್ಲದೇ ಈ ಜಮೀನುಗಳ ಮೇಲೆ ಯಾವುದೇ ಸಾಲದ ಭೋಜಾ ಇರುವುದಿಲ್ಲ. ಈ ಜಮೀನುಗಳ ಬಗ್ಗೆ ಯಾವುದೇ ನ್ಯಾಯಾಲಯಗಳಲ್ಲಿ ವ್ಯಾಜ್ಯಗಳು ಇರುವುದಿಲ್ಲ.

ಕ್ರಮ ಸಂಖ್ಯೆ	ಹೆಸರು ಮತ್ತು ವಿಳಾಸ	ಸಹಿ
1	ಗಿರೀಶ್. ಕೆ. ಪಾಟೀಲ ಬ್ಯಾಡಗಿ	
2	ಮಂಜಪ್ಪಗೌಡ.ಫಕ್ಕೀರಪ್ಪ ಪೇಸ್ಟಿ ಹಲಗೇರಿ	

ಉಪ ನೋಂದಣಾಧಿಕಾರಿ
ಬ್ಯಾಡಗಿ

1 ನೇ ಪುಸ್ತಕದ ದಸ್ತಾವೇಜು
ಸಂಖ್ಯೆ BYD-1-03160-2014-15 ಆಗಿ
ಸ್ಕ್ಯಾನ್ ಸಂಖ್ಯೆ BYDD63 ನೇ ದ್ದರಲ್ಲಿ
ದಿನಾಂಕ 03-03-2015 ರಂದು ನೋಂದಾಯಿಸಲಾಗಿದೆ

ಉಪ ನೋಂದಣಾಧಿಕಾರಿ
ಬ್ಯಾಡಗಿ

3 MAR 2015

Sales and Registration details for STP land

ಕರ್ನಾಟಕ ಸರ್ಕಾರ
Government of Karnataka

ನೋಂದಣಿ ಹಾಗೂ ಮುದ್ರಾಂಕ ಇಲಾಖೆ
Registration and Stamps Department

This sheet can be used for any document

Date of execution

Total stamp duty paid Rs.

Document Sheet

3209/14-15

ಸದರ ಜಮೀನುಗಳಿಗೆ ಹೊಂದಿಕೊಂಡಿರುವ ಸರ್ವೆ ನಂಬರ 64, 65/1 ಹಾಗೂ 66 ನೇ ಜಮೀನುಗಳ ಮಾಲೀಕರು ಈ ಜಮೀನುಗಳಿಗೆ ಓಡಾಡಲು, ದಾರಿ ಸಲುವಾಗಿ ತಮ್ಮ ಜಮೀನುಗಳನ್ನು ನಿಮಗೆ ಕೊಟ್ಟಿರುತ್ತಾರೆ. ನಿಮಗೆ ದಾರಿ ಸಲುವಾಗಿ ಕೊಟ್ಟ ಜಮೀನುಗಳಲ್ಲಿ ಅವರಿಗೂ ಕೂಡಾ ಎತ್ತು ಚಕ್ಕಡಿ, ಗಳೆ ಹಾಗೂ ಟ್ರ್ಯಾಕ್ಟರ ಓಡಾಡಲು ದಾರಿ ಕೊಡಬೇಕು ಅನ್ನುವ ಕರಾರು ಅದೆ.

ಈ ವ್ಯವಹಾರದಿಂದ ಮುಂದೇನಾದರೂ ತಂಟೆ ತಕರಾರು ಬಂದು ನಿಮ್ಮ ಪುರಸಭೆಗೆ ಲುಕ್ಸಾನ ಆದಲ್ಲಿ ಅದನ್ನು ಖರ್ಚ ಸಹಿತ ನಾನು ರಿವಾಜು ಪ್ರಕಾರ ಸರಿಪಡಿಸಿ ಕೊಡುತ್ತೇನೆ. ಇಂದೇ ಈ ಖರೀದಿ ಪತ್ರವನ್ನು ಬರೆಯಿಸಿ ಓದಿ, ಕೇಳಿ ತಿಳಿದು, ನನ್ನ ಹೇಳಿಕೆಯ ಮೇರೆಗೆ ಬರೆದಿದ್ದು ಸರಿ ಇದೆ ಎಂದು ಒಪ್ಪಿ, ಈ ಖರೀದಿ ಪತ್ರಕ್ಕೆ ನನ್ನ ಸಹಿ ಮಾಡಿರುತ್ತೇನೆ. ಅಂತಾ ನಾನು ನನ್ನ ಆತ್ಮ ಸಂತೋಷದಿಂದ ವ ಅಕ್ಕಲು ಹುಷಾರಿಯಿಂದ ಬರೆಯಿಸಿಕೊಟ್ಟ ದಕ್ಕ ಖರೀದಿ ಪತ್ರವು ಸಹಿ.

ಬ್ಯಾಡಗಿ,

ದಿನಾಂಕ:-09-03-2015

ಖರೀದಿ ಕೊಟ್ಟವರ ಸಹಿ.

ಖರೀದಿ ತೆಗೆದುಕೊಂಡವರ ಸಹಿ.

ಸಾಕ್ಷಿ ಸಹಿ

1) M.P. Yallannanavar Byadgi

2) (S.B. Bonakar) Gummanahalli

ಜಾರು ಪ್ರತಿ ತಯಾರಿಸಿ
ಗಣಕ ಯಂತ್ರದಲ್ಲಿ ಮಾಡಿಕೊಟ್ಟವರು

ಪರಶುರಾಮ ಬಿ. ಹಡಗಲಿ
ಪತ್ರ ಬರಹಗಾರರು

ಎರಡು ಸಾವಿರದ ಹದಿನೈದನೇ ಇಸವಿ, ಮಾರ್ಚ ತಿಂಗಳು, ಒಂಬತ್ತನೇ ದಿನಾಂಕದಂದು ಹಾವೇರಿ ಜಿಲ್ಲಾ ಬ್ಯಾಡಗಿ ತಾಲೂಕ ಬ್ಯಾಡಗಿ ಹೋಬಳಿಗೆ ಸೇರಿದ. ತರೇದಹಳ್ಳಿ ಗ್ರಾಮದ ಖುಷ್ಕಿ ಯರಿ ಹಾಗೂ ಮಸಾರಿ ಜಮೀನುಗಳ ದಕ್ಕ ಖರೀದಿ ಪತ್ರ ₹. 1,36,12,550/- [ರೂ. ಒಂದು ಕೋಟಿ ಮೂವತ್ತಾರು ಲಕ್ಷ ಹನ್ನೆರಡು ಸಾವಿರದ ಐದನೂರಾ ಐವತ್ತು]ಗಳು ಮಾತ್ರ.

ಮಾನ್ಯ ಘನವೆತ್ತ ರಾಜ್ಯಪಾಲರು, ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸರಕಾರ, ಬೆಂಗಳೂರು ಇವರ ಪರವಾಗಿ, ಮುಖ್ಯಾಧಿಕಾರಿಗಳು ಪುರಸಭೆ ಬ್ಯಾಡಗಿ, ತಾಲೂಕ ಬ್ಯಾಡಗಿ, ಜಿಲ್ಲಾ ಹಾವೇರಿ ಇವರಿಗೆ.

ದಕ್ಕ ಖರೀದಿ ಪತ್ರ ಬೇಸ್ಕಿ :- **ಶ್ರೀ ಗಿರೀಶಗೌಡ ಪಿನ್ ಸಿದ್ದನಗೌಡ ಪಾಟೀಲ**, PAN CARD No.AYUPP0645C ವಯಸ್ಸು 53, ಉದ್ಯೋಗ ವ್ಯವಸಾಯ, ವಿಳಾಸ:- ಬಸವೇಶ್ವರ ನಗರ ಬ್ಯಾಡಗಿ, ತಾಲೂಕ ಬ್ಯಾಡಗಿ, ಜಿಲ್ಲಾ ಹಾವೇರಿ. ನಾನು ಬರೆಯಿಸಿಕೊಡುವ ದಕ್ಕ ಖರೀದಿ ಪತ್ರ ಏನಂದರೆ,

ಶೆಡ್ಯೂಲದಲ್ಲಿ ಕಾಣಿಸಿದ ಜಮೀನುಗಳು ಪಿತ್ರಾರ್ಜಿತ ಜಮೀನುಗಳು ಇದ್ದು, ಇವುಗಳು ನನಗೆ ವಾರಸಾ ವ ವಾಟ್ಣಿ ಪ್ರಕಾರ ಬಂದ ಜಮೀನುಗಳು ಇರುತ್ತವೆ. ಸದರ ಜಮೀನುಗಳ ಬಗ್ಗೆ ನಾನು ಸರಕಾರಕ್ಕೆ ವ ಇತರೆ ಸಂಘ ಸಂಸ್ಥೆಗಳಿಗೆ ಕಟ್ಟತಕ್ಕ ಕರ ಕಂದಾಯಗಳನ್ನು ಕಟ್ಟಿ, ಸದರ ಜಮೀನುಗಳನ್ನು ಇಂದಿಗೂ ನನ್ನ ಪ್ರತ್ಯಕ್ಷ ಕಬ್ಜಾದಲ್ಲಿ ಇಟ್ಟುಕೊಂಡಿರುತ್ತೇನೆ. ಸದರ ಜಮೀನುಗಳು ಗ್ರಾಮದಿಂದ ಒಂದು ಕಿ.ಮೀ ದೂರ ಇರುತ್ತವೆ. ಇವುಗಳಿಗೆ ದಾರಿ ಸೌಕರ್ಯ ಇರುತ್ತದೆ. ಈ ಜಮೀನುಗಳಿಗೆ ಯಾವುದೇ ನೀರಾವರಿ ಸೌಕರ್ಯ ಇರುವದಿಲ್ಲ. ಸದರ ಜಮೀನುಗಳು ಖುಷ್ಕಿ ಯರಿ ಹಾಗೂ ಮಸಾರಿ ಜಮೀನುಗಳು ಇದ್ದು, ಇವುಗಳಲ್ಲಿ ಉದ್ದು, ಹೆಸರು, ಹತ್ತಿ, ಗೋವಿನಜೋಳ, ಬಳಜೋಳ ವಗೈರೆ ಬೆಳೆ ಬೆಳೆಯುತ್ತವೆ. ಸದರ ಜಮೀನುಗಳನ್ನು ದಕ್ಕ ಖರೀದಿಗೆ ಕೊಡಲು ಕಾರಣವೇನೆಂದರೆ,

ಒಳಚರಂಡಿ ನೀರು ಶುದ್ಧೀಕರಣ ಘಟಕವನ್ನು ಸ್ಥಾಪಿಸುವ ಸಲುವಾಗಿ ನೀವು

Print Date & Time : 09-03-2015 04:51:57 PM

ದಸ್ತಾವೇಜು ಸಂಖ್ಯೆ : 3209

ಸೂ ರಜಿಸ್ಟ್ರಾರ ಬ್ಯಾಡಗಿ ರವರ ಕಚೇರಿಯಲ್ಲಿ ದಿನಾಂಕ 09-03-2015 ರಂದು 04:41:22 PM ಗಂಟೆಗೆ ಈ ಕೆಳಗೆ ವಿವರಿಸಿದ ಶುಲ್ಕವೊಂದಿಗೆ

ಕ್ರಮ ಸಂಖ್ಯೆ	ವಿವರ	ರೂ. ಪೈ
1	ಸ್ಟ್ಯಾಂಪಿಂಗ್ ಫೀ	245.00
2	ಪರಿವೀಕ್ಷಣಾ ಶುಲ್ಕ	70.00
3	ಪರಿಶೋಧನಾ ಶುಲ್ಕ	35.00
	ಒಟ್ಟು :	350.00

ಶ್ರೀ ಮಾನ್ಯ ಘನವೆತ್ತ ರಾಜ್ಯಪಾಲರು ಕರ್ನಾಟಕ ಸರಕಾರ ಬೆಂಗಳೂರ ಇವರ ಪರವಾಗಿ ಮುಖ್ಯಾಧಿಕಾರಿಗಳು ಪುರಸಭೆ ಬ್ಯಾಡಗಿ ಇವರಿಂದ ತಾಲುಕ ಮಾಡಲ್ಪಟ್ಟದ್ದ

ಹೆಸರು	ಫೋಟೊ	ಹೆಬ್ಬೆಟ್ಟಿನ ಗುರುತು	ಸಹಿ
ಶ್ರೀ ಮಾನ್ಯ ಘನವೆತ್ತ ರಾಜ್ಯಪಾಲರು ಕರ್ನಾಟಕ ಸರಕಾರ ಬೆಂಗಳೂರ ಇವರ ಪರವಾಗಿ ಮುಖ್ಯಾಧಿಕಾರಿಗಳು ಪುರಸಭೆ ಬ್ಯಾಡಗಿ			ಮುಖ್ಯಾಧಿಕಾರಿ ಪುರಸಭೆ ಕಾರ್ಯಾಲಯ, ಬ್ಯಾಡಗಿ

ಉಪಸಂಯೋಜಿತ ಅಧಿಕಾರಿ
ಬ್ಯಾಡಗಿ

ಬರೆದುಕೊಟ್ಟವರಾಗಿ ಒಪ್ಪಿರುವವರೆ

ಕ್ರಮ ಸಂಖ್ಯೆ	ಹೆಸರು	ಫೋಟೊ	ಹೆಬ್ಬೆಟ್ಟಿನ ಗುರುತು	ಸಹಿ
1	ಮಾನ್ಯ ಘನವೆತ್ತ ರಾಜ್ಯಪಾಲರು ಕರ್ನಾಟಕ ಸರಕಾರ ಬೆಂಗಳೂರ ಇವರ ಪರವಾಗಿ ಮುಖ್ಯಾಧಿಕಾರಿಗಳು ಪುರಸಭೆ ಬ್ಯಾಡಗಿ . (ಬರೆಸಿಕೊಂಡವರು)			ಮುಖ್ಯಾಧಿಕಾರಿ ಪುರಸಭೆ ಕಾರ್ಯಾಲಯ, ಬ್ಯಾಡಗಿ
2	ಪಾಟೀಲ ಗಿರೀಶಗೌಡ ಬಿನ್ ಶಿವನಗೌಡ (ಬರೆದುಕೊಟ್ಟವರು)			

ಉಪಸಂಯೋಜಿತ ಅಧಿಕಾರಿ
ಬ್ಯಾಡಗಿ

3209/14-15

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ಗುರುತಿಸುವವರು

ಕ್ರಮ ಸಂಖ್ಯೆ	ಹೆಸರು ಮತ್ತು ವಿಳಾಸ	ಸಹಿ
1	ಎಮ್.ಪಿ.ಯಲ್ಲಾಪುರದ ಬ್ಯಾಡಗಿ	
2	ಎಸ್.ಬಿ.ಬಣಕಾರ ಗುಮ್ಮನಹಳ್ಳಿ	

ಉಪ ನೋಂದಣಿ ಅಧಿಕಾರಿ
ಬ್ಯಾಡಗಿ.

1 ನೇ ಪುಸ್ತಕದ ದಸ್ತಾವೇಜು
ಸಂಖ್ಯೆ BYD-1-03209-2014-15 ಆಗಿ
ಸ್ಕ್ಯಾ. ಸಂಖ್ಯೆ BYDD63 ನೇ ದ್ದರಲ್ಲಿ
ದಿನಾಂಕ 09-03-2015 ರಂದು ನೋಂದಾಯಿಸಲಾಗಿದೆ

ಉಪ ನೋಂದಣಾಧಿಕಾರಿ ಕಾರ್ಯಾಲಯ
ಬ್ಯಾಡಗಿ 9 MAR 2015

Designed and Developed by C-DAC, ACTS, Pune

ಉಪ ನೋಂದಣಾಧಿಕಾರಿಗಳ ಕಚೇರಿ
the Seal of the Sub-Registrar
BYADGI
ಬ್ಯಾಡಗಿ

Appendix 6. Ownership Details of the Septic tank site

ಪುರಸಭೆ ಕಾರ್ಯಾಲಯ
ಬ್ಯಾಡಗಿ -581106.
ಜಿ॥ ಹಾವೇರಿ) (ಕರ್ನಾಟಕ ರಾಜ್ಯ

TOWN MUNICIPAL COUNCIL
BYADGI-581106.
Dist : Haveri) (Karnataka State

☎ (08375). ಸಹಿರಿ: 228444. ಅಧ್ಯಕ್ಷರು: 228266. ಫ್ಯಾಕ್ಸ್: 226444

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ಬೆಂಗಳೂರು.

ಮಾನ್ಯರೇ,

ಸ್ವಚ್ಛ ಭಾರತ್ ಮಿಷನ್ ಕಾರ್ಯಕ್ರಮದಡಿ ಜಾಗದ ಕೊರತೆ

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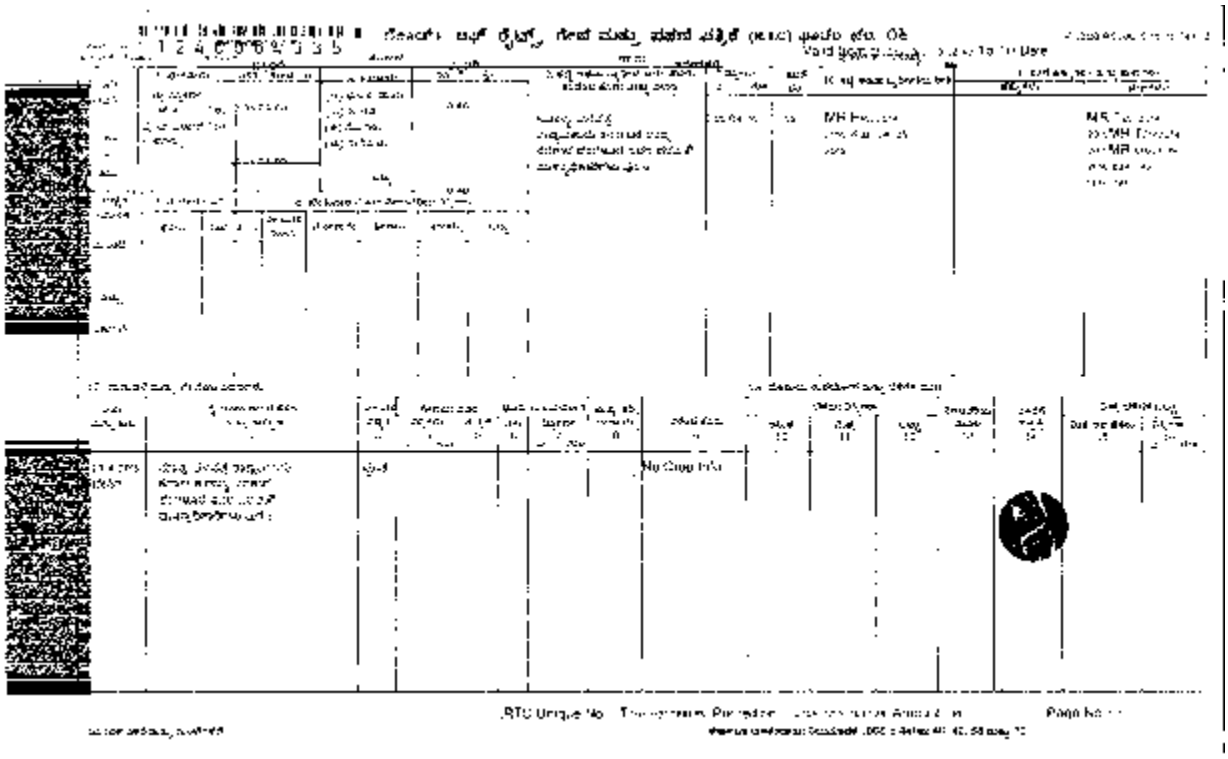
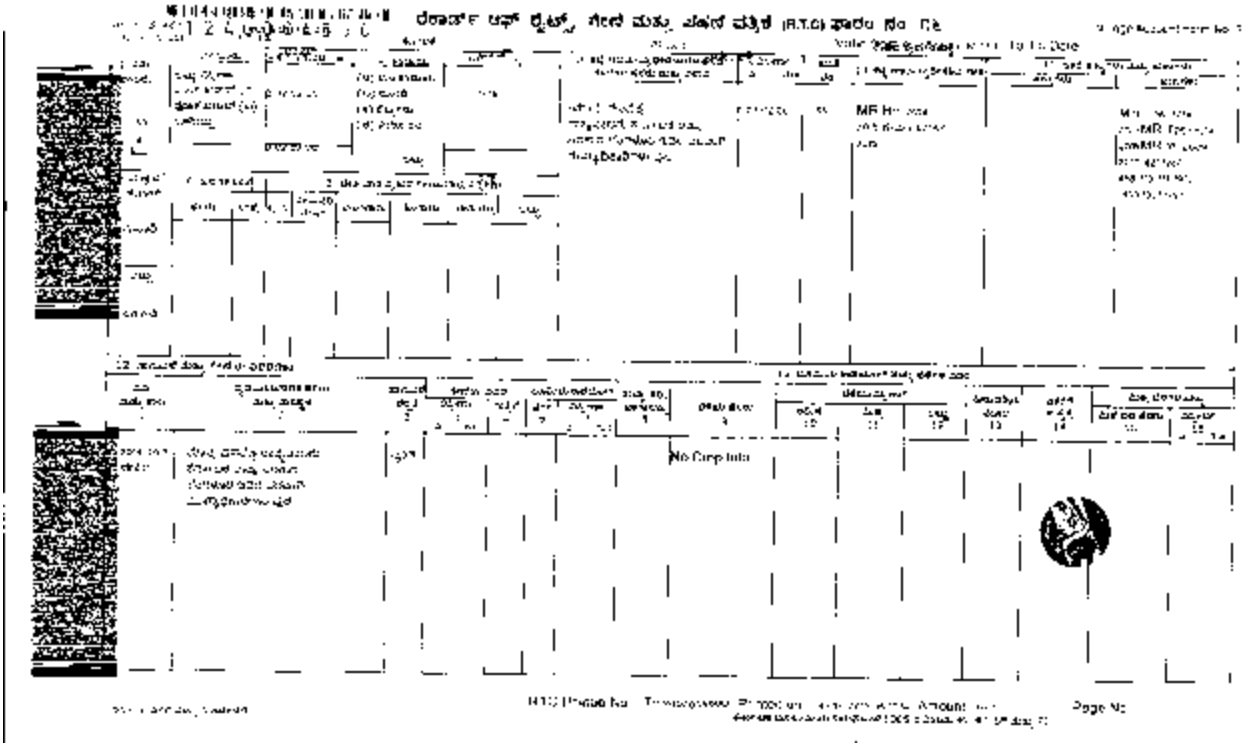
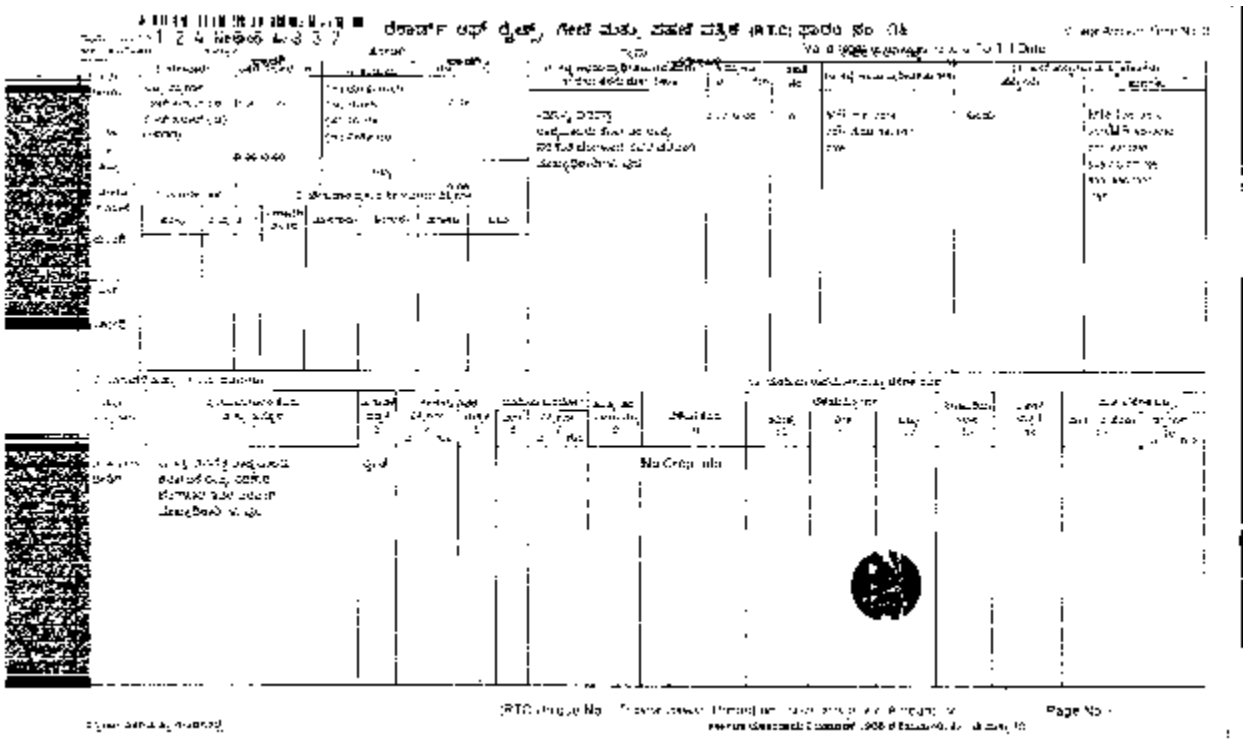
ಸ್ವಚ್ಛ ಭಾರತ್ ಮಿಷನ್ ಕಾರ್ಯಕ್ರಮದಡಿ ಬ್ಯಾಡಗಿ ಪಟ್ಟಣದಲ್ಲಿ ಶೌಚಾಲಯಗಳನ್ನು ನಿರ್ಮಿಸಲು ಸರ್ವೇ ನಂ. ಅಳತೆ ಮಾಡಿಸಲಾಗಿದ್ದು, ಸದರಿ ಜಾಗದಲ್ಲಿ ಸಾರ್ವಜನಿಕರು ಶೌಚಾಲಯ ಬಳಸುವ ಬಗ್ಗೆ ಮತ್ತು ಜಾಗದಲ್ಲಿ ಸ್ವಾಮಿದಾರಿ ಸೆಪ್ಟಿಕ್ ಟ್ಯಾಂಕ್ ಕಟ್ಟಿಸಿ ನಿರ್ವಹಣೆ ಮಾಡಲು ಸೂಚಿಸಿದ್ದು ಅದರಂತೆ ಪೌರಾಯುಕ್ತರು ತಿಳಿಸಿದ್ದಾರೆ. ಆದುದರಿಂದ ಸೆಪ್ಟಿಕ್ ಟ್ಯಾಂಕ್ ಕಟ್ಟಿಸಲು ಸರ್ವೇ ನಂ. ಜಾಗವನ್ನು ಆಸ್ತಿಯಾಗಿದ್ದು ಸದರಿ ಜಾಗದಲ್ಲಿ ಕಾಮ್ಯ ಸೆಪ್ಟಿಕ್ ಟ್ಯಾಂಕ್ ಕಟ್ಟಿಸಲು ಯಾವುದೇ ತಕರಾರು ಇರುವುದಿಲ್ಲವೆಂದು ಈ ಮೂಲಕ ತಮ್ಮ ಗಮನಕ್ಕೆ ತರಲಾಗಿದೆ

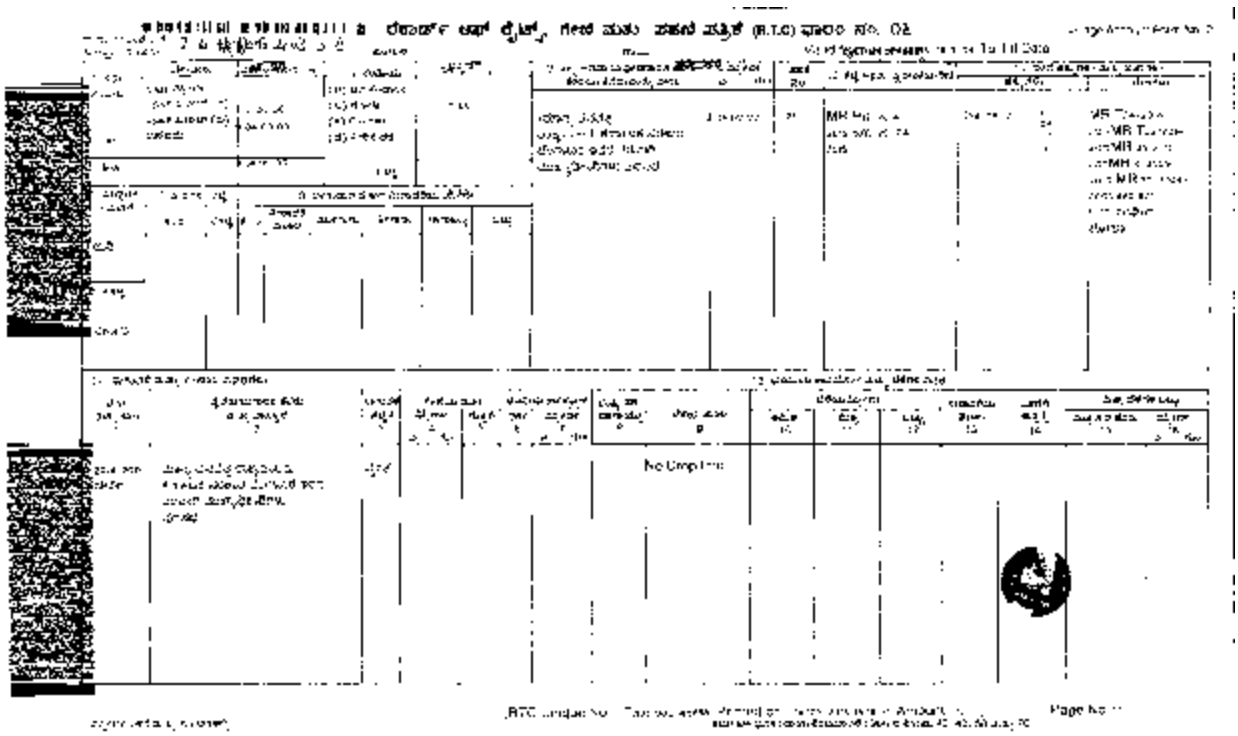
ತಮ್ಮ ವಿಶ್ವಾಸಿ,

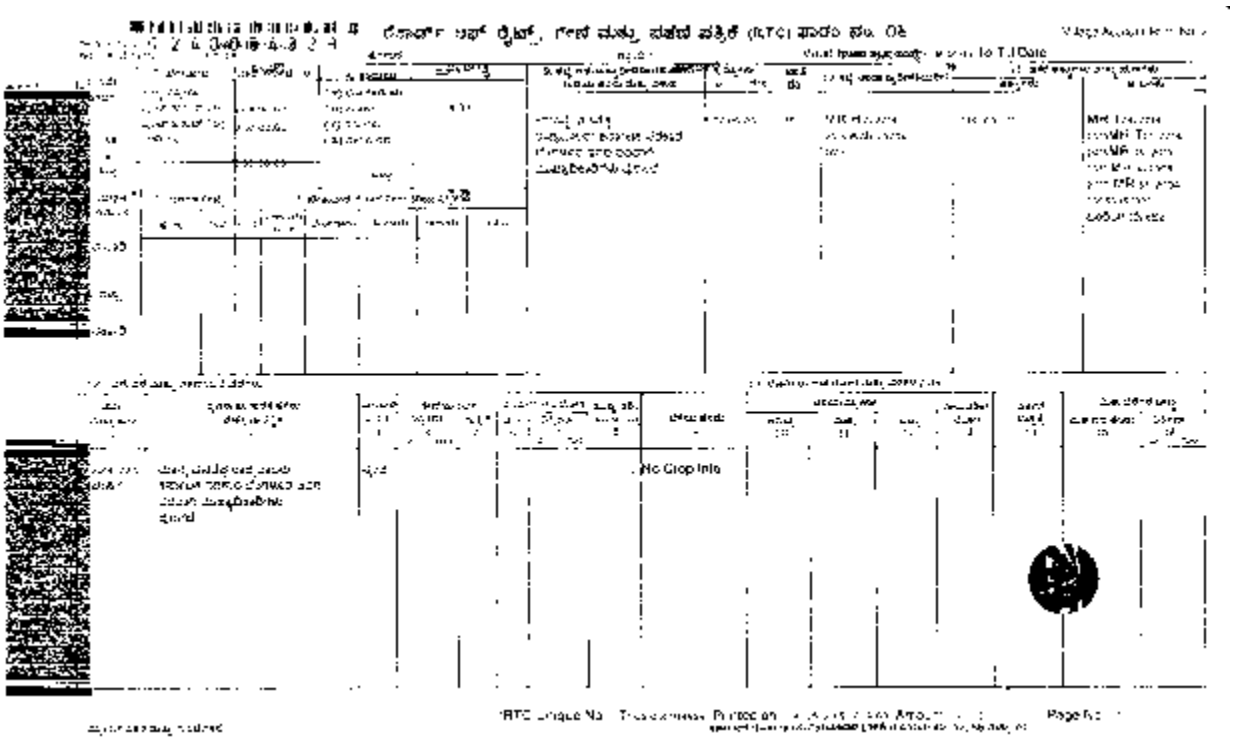
(ಸಿ.ಎಸ್. ಮೂಲಿಮನಿ)
ಮುಖ್ಯಾಧಿಕಾರಿ
ಪುರಸಭೆ, ಬ್ಯಾಡಗಿ







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Appendix 7 : Emergency Response Plan Template

(Sewer Network Operation)

Section1. System Information

Keep this basic information easily accessible to authorized staff for emergency responders, repair people, and the news media.

System information

System Name and Address		
Directions to the System		
Basic Description and Location of System Facilities		
Population Served and Service Connections	_____ people	_____ connections
System Owner		
Name, Title, and Phone Number of Person Responsible for Maintaining and Implementing the Emergency Plan		_____ Phone _____ Mobile

Section 2. Chain of Command – Lines of Authority

The first response step in any emergency is to inform the person at the top of this list, who is responsible for managing the emergency and making key decisions.

Chain of command – lines of authority

Name and Title (as required)	**Examples of Responsibilities During an Emergency**	**Contact Numbers**
Mr/Ms……. **Sewerage System Manager(s)**	Responsible for overall management and decision making for the sanitation, water & wastewater system. The Wastewater / Sanitation System Manager is the lead for managing the emergency, providing information to regulatory agencies, the public and news media. All communications to external parties are to be approved by the manager.	Phone: Mobile:
Mr/Ms …….. **Sanitation System Operator(s)**	In charge of operating the wastewater systems, sanitation system, performing inspections, maintenance and sampling and relaying critical information, assessing facilities, and providing	Phone: Mobile:

Name and Title (as required)	Examples of Responsibilities During an Emergency	Contact Numbers
	recommendations to the system manager	
Mr/Ms Sewerage Treatment Plant / Operator(s)	In charge of running treatment plants, performing inspections, maintenance and sampling and relaying critical information, assessing facilities, and providing recommendations to the system manager.	Phone: Mobile:
Mr/Ms…….. Office Administrator	Responsible for administrative functions in the office including receiving phone calls and keeping a log of events. This person will provide a standard carefully pre-scripted message to those who call with general questions. Additional information will be released through the wastewater system manager.	Phone: Mobile:
Mr/Ms…… Field Staff	Delivers door hangers, posts notices, and supports wastewater / sanitation system operator.	Phone: Mobile:

Section 3.Events that Cause Emergencies

The events listed below may cause wastewater system emergencies. They are arranged from highest to lowest probable risk.

Events that cause emergencies

Type of Event	Probability or Risk (High-Med-Low)	Comments
Burst of sewer line		
Leak of sewer line		
Overflow of sewer line		
Power outage at STP		
Leakage or overflow at community toilets		
Leakage at community toilet connection lines		

Section 4. Emergency Notification

Notification call-up lists -Use these lists to notify first responders of an emergency.

Emergency Notification List				
Organization or Department	**Name & Position**	**Telephone**	**Night or Cell Phone**	**Email**

Urban Local Body				
Sewer / Sanitation Operator (if contractor)				
Primacy Agency Contact				
Sewer / Sanitation Systems Manager Contact				

Priority Customers				
Organization or Department	**Name & Position**	**Telephone**	**Night or Mobile Phone**	**Email**
Hospitals or Clinic(s)				
Public or Private Schools				
Public Water System				

Notification List				
Organization or Department	**Name & Position**	**Telephone**	**Night or Mobile Phone**	**Email**
Police				
Regulatory Agency				
Authorized Testing Laboratory				

Service / Repair Notifications				
Organization or Department	**Name & Position**	**Telephone**	**Night or Mobile Phone**	**Email**
Bangalore Electricity Supply Company				
Electrician				
Water Testing Lab.				
Wastewater systems operator/manager				
Plumber				

Service / Repair Notifications				
Organization or Department	**Name & Position**	**Telephone**	**Night or Mobile Phone**	**Email**
Pump Supplier				
"Call Before You Dig"				
Rental Equipment Supplier				
Pipe Supplier				

Notification procedures

Notify wastewater system customers

Who is Responsible:	
Procedures:	

Alert local law enforcement, or regulatory officials, and local health agencies

Who is Responsible:	
Procedures:	

Contact service and repair contractors

Who is Responsible:	
Procedures:	

Procedures for issuing a health advisory

Who is Responsible:	
Procedures:	

Other procedures, as necessary

Who is Responsible:	
Procedures:	

Section 5. Effective Communication

Communication with customers, the news media, and the general public is a critical part of emergency response.

Designated public spokesperson

Designate a spokesperson (and alternate) and contact regulatory agency for delivering messages to the news media and the public.

Designate a spokesperson and alternates

Spokesperson	Alternate

Section 6. The Vulnerability Assessment

This is an evaluation of each wastewater system component to identify weaknesses or deficiencies that may make them susceptible to damage or failure during an emergency. It also assesses facilities for security enhancements that may guard against unauthorized entry, vandalism, or terrorism.

Facility vulnerability assessment and improvements identification

System Component	Description and Condition	Vulnerability	Improvements or Mitigating Actions	Security Improvements
Collection System				
Sewage Pumping				
Community Toilets				
Other Considerations				

Section 7. Response Actions for Specific Events

In any event there are a series of general steps to take:

1. Analyze the type and severity of the emergency;
2. Take immediate actions to save lives;
3. Take action to reduce injuries and system damage;
4. Make repairs based on priority demand; and
5. Return the system to normal operation.

The following tables identify the assessment, set forth immediate response actions, define what notifications need to be made, and describe important follow-up actions.

A. Power outage

Assessment	
Immediate Actions	
Notifications	
Follow-up Actions	

B. Collection system blockage or line break

Assessment	
Immediate Actions	
Notifications	
Follow-up Actions	

C. Collection system pumping facilities failure

Assessment	
Immediate Actions	
Notifications	
Follow-up Actions	

D. Vandalism or terrorist attack

Assessment	
Immediate Actions	
Notifications	
Follow-up Actions	

E. Flood

Assessment	
Immediate Actions	
Notifications	
Follow-up Actions	

F. Earthquake

Assessment	
Immediate Actions	
Notifications	
Follow-up Actions	

G. Hazardous materials spill into collection system

Assessment	
Immediate Actions	
Notifications	
Follow-up Actions	

H. Electronic equipment failure

Assessment	
Immediate Actions	
Notifications	
Follow-up Actions	

I. Other

Assessment	
Immediate Actions	
Notifications	
Follow-up Actions	

Section 8. Returning to Normal Operation

Returning to normal operations

Action	Description and Actions

Section 9. Plan Approval

Plan approval

This plan is officially in effect when reviewed, approved, and signed by the following people:

Name/Title	Signature	Date

Section 10.Certificate of Completion

I certify to the Government of Karnataka that this sewerage system for Byadgi town has completed an Emergency Response Plan (ERP).

I certify that this document was prepared under my direction or supervision.

_____

System Name: _____

Address: _____

Print Name of Person Authorized to Sign this Certification on behalf of the System:

_____ **Title:** _____

Signature: _____

Phone: _____ **Fax:** _____ **Email:** _____

Completion of the following:

☐ Security Vulnerability Assessment

☐ Emergency Response Plan

Source: www.rcap.org (modified)

Appendix 8-List of Clearances Required

No	Permission	Sewer Network	STP	Responsibility
1	KSPCB	NA	CFE and CFO	TMC (in process)
2	National Highways / PWD	No	NA	NA
3	Railway	No	NA	NA
4	Utilities (ESCOM, BSNL)	Clearance Required	NA	TMC / PIU
5	Labour License	License Required	License Required	Contractor
6	Forest	NA	NA	NA

Appendix 9-Traffic Management Planning (TMP)

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 every 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

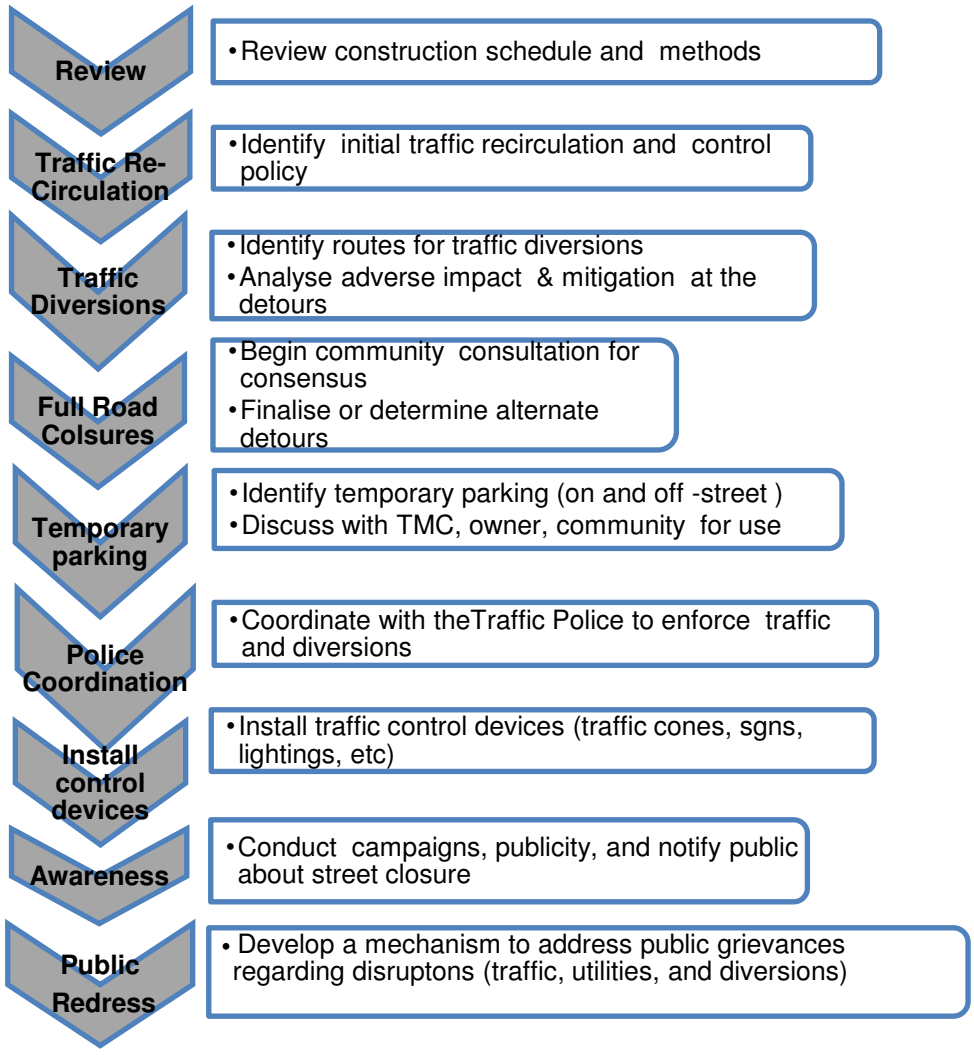
4. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

(i) approval from the Byadgi City Corporation / 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.

7. 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.

8. 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.

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

10. 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

11. 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

12. 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”).

13**.** **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:

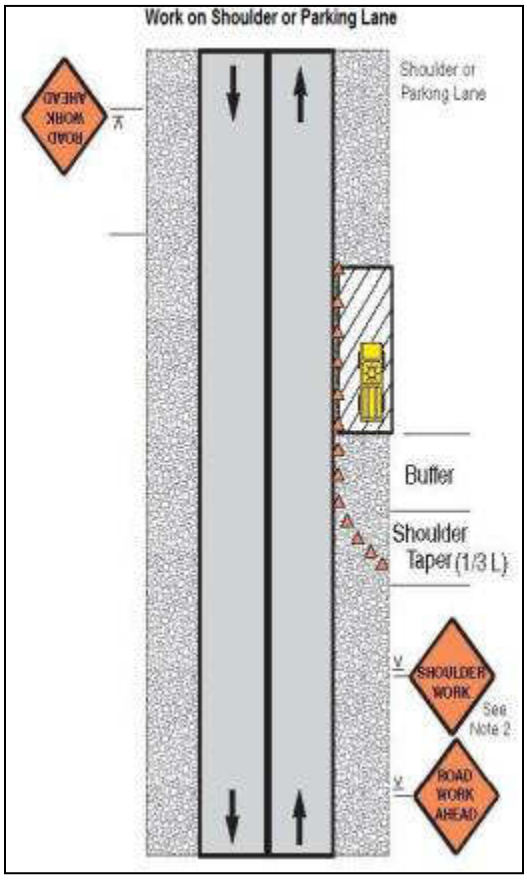
- Work on shoulder or parking lane
- Shoulder or parking lane closed on divided road
- Work in Travel lane
- Lane closure on road with low volume
- Lane closure on a two-line road with low volume (with yield sign)
- Lane closure on a two-line road with low volume (one flagger operation)
- Lane closure 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

14. 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.

15. 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



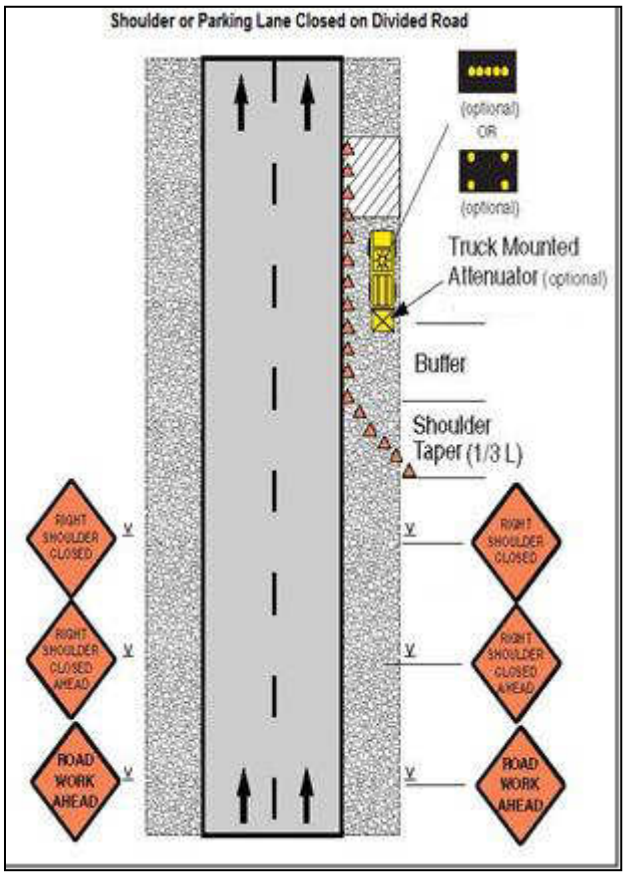
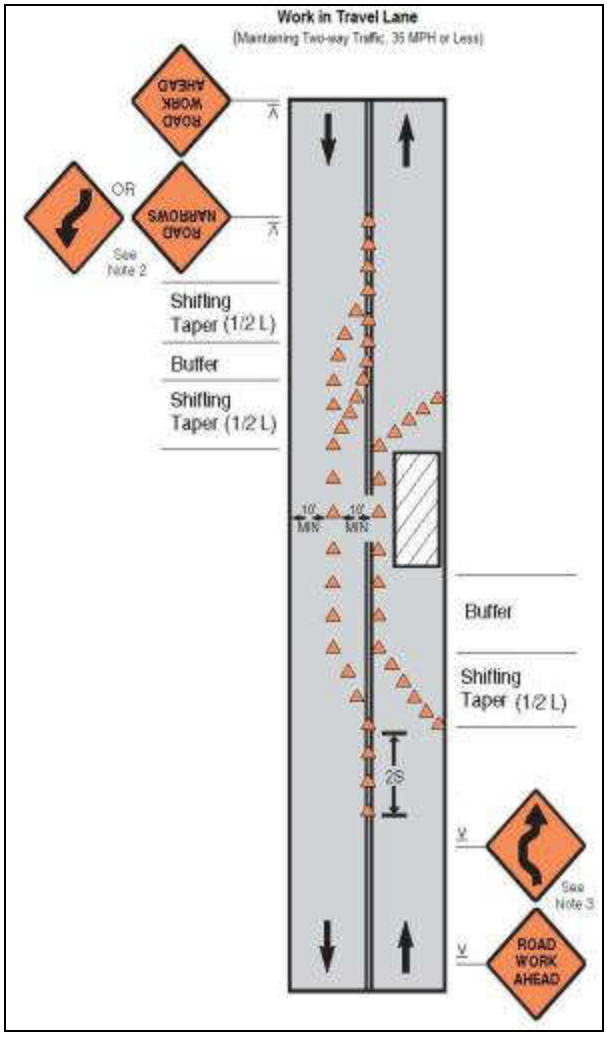


Figure A4 & A5: Work in Travel lane & Lane closure on road with low volume



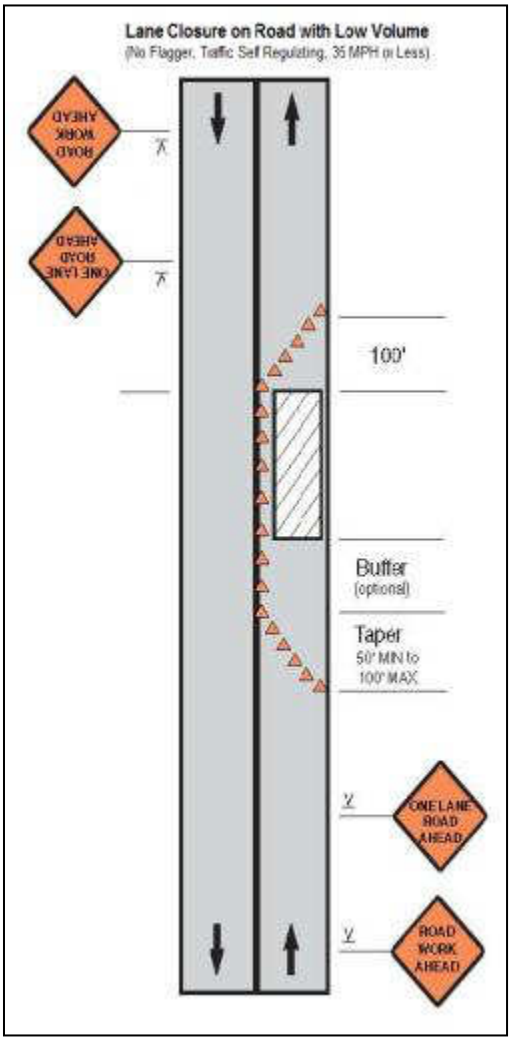
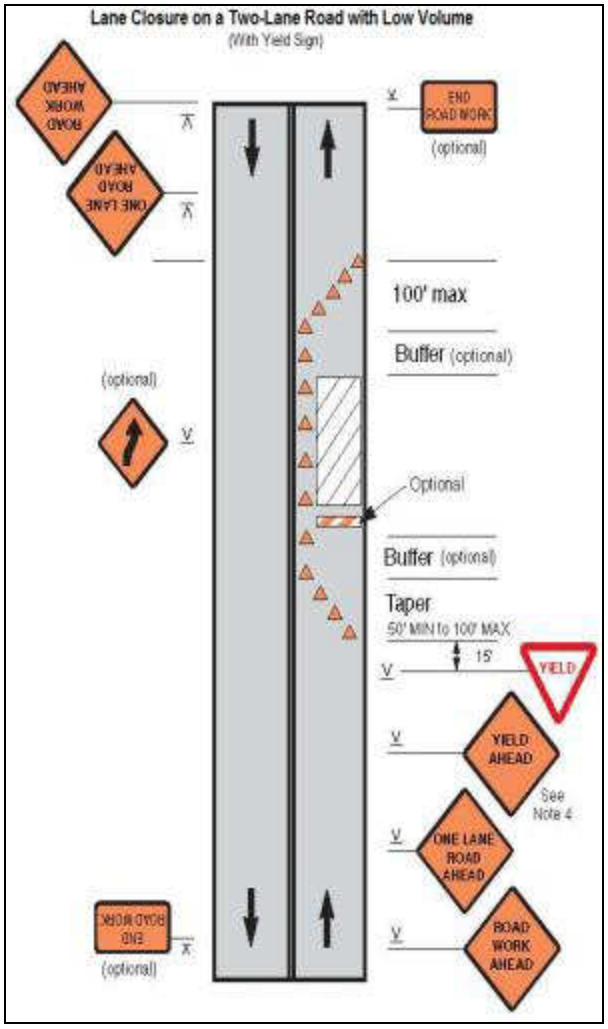


Figure A6 & A7: Lane closure on a two-line road with low volume (with yield sign) & Lane closure on a two-line road with low volume (one flagger operation)


Lane Closure on a Two-Lane Road with Low Volume
(With Yield Sign)
ROAD WORK AHEAD
ONE LANE ROAD AHEAD
END ROAD WORK
(optional)
100' max
Buffer (optional)
(optional)
Optional
Buffer (optional)
Taper
50' MIN to 100' MAX
15'
YIELD
YIELD AHEAD
See Note 4
ONE LANE ROAD AHEAD
ROAD WORK AHEAD
END ROAD WORK
(optional)

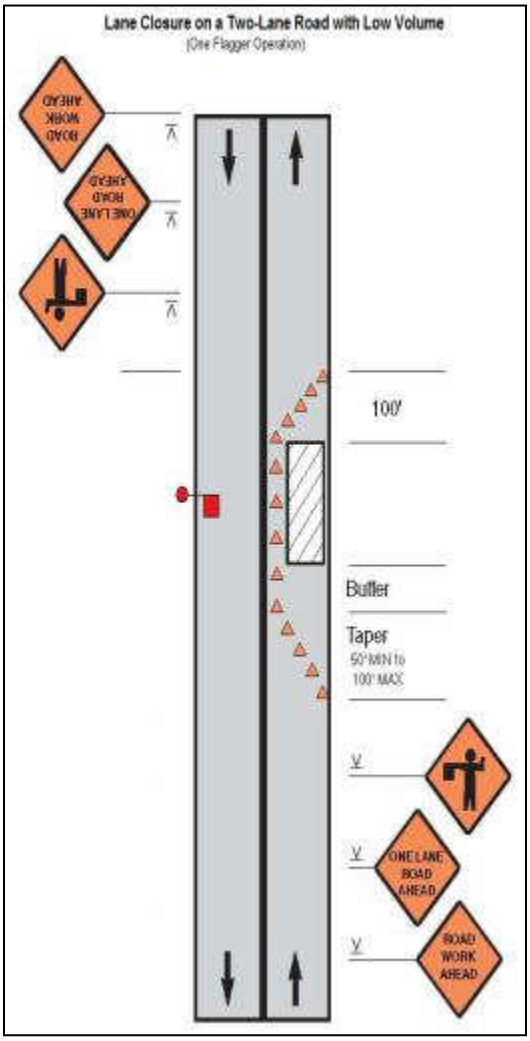
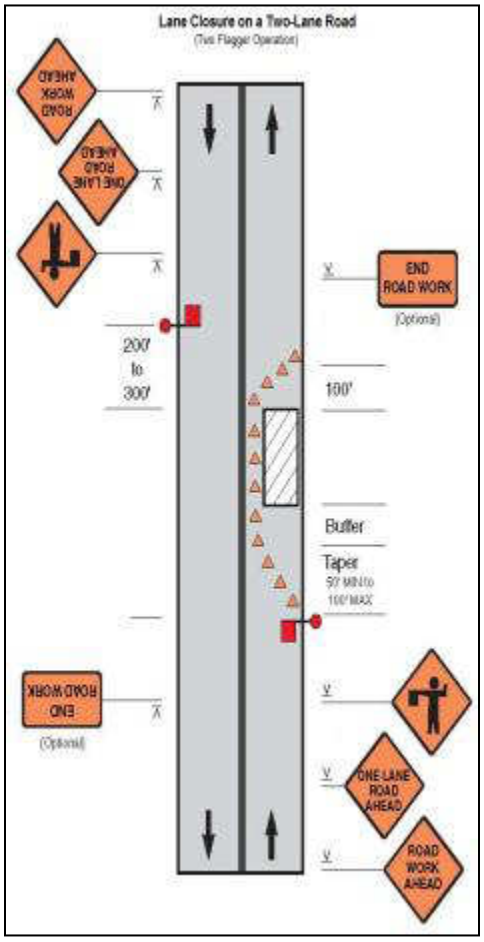

Lane Closure on a Two-Lane Road with Low Volume
(One Flagger Operation)
ROAD WORK AHEAD
ONE LANE ROAD AHEAD
100'
Buffer
Taper
50' MIN to 100' MAX
ONE LANE ROAD AHEAD
ROAD WORK AHEAD

Figure A8 & A9: Lane closure on a two lane road (two flagger operation) & Lane closure on a four lane undivided Road



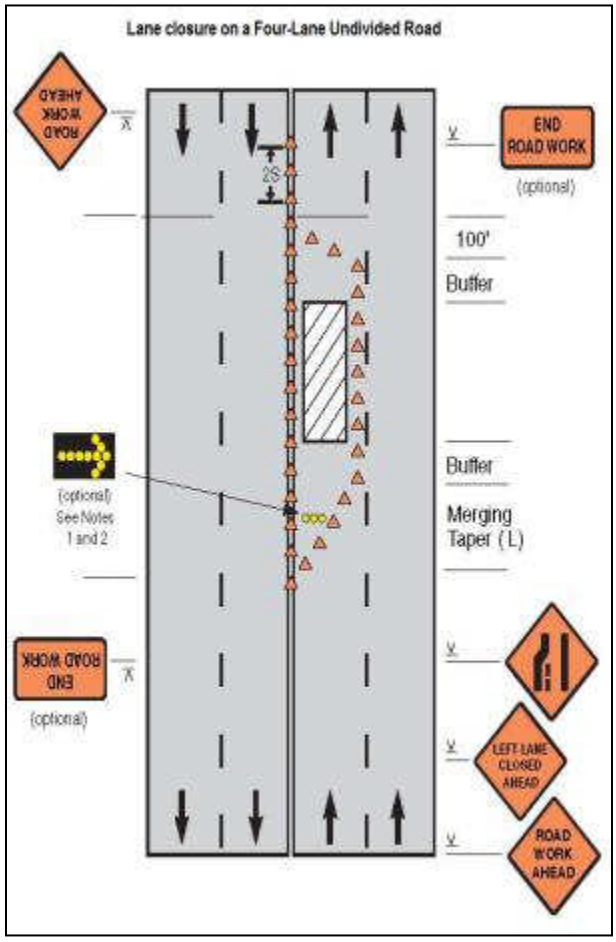
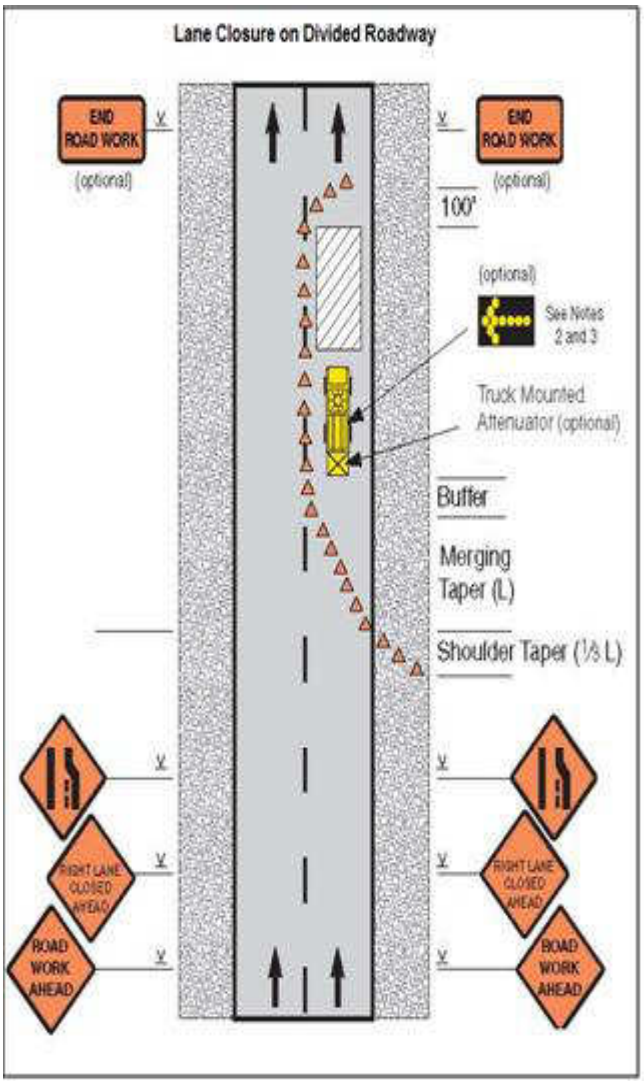


Figure A10 & A11: Lane closure on divided roadway &Half road closure on multi-lane roadway


Lane Closure on Divided Roadway
END ROAD WORK
(optional)
END ROAD WORK
(optional)
100'
(optional)
See Notes 2 and 3
Truck Mounted Attenuator (optional)
Buffer
Merging Taper (L)
Shoulder Taper (1/3 L)
RIGHT LANE CLOSED AHEAD
ROAD WORK AHEAD
RIGHT LANE CLOSED AHEAD
ROAD WORK AHEAD

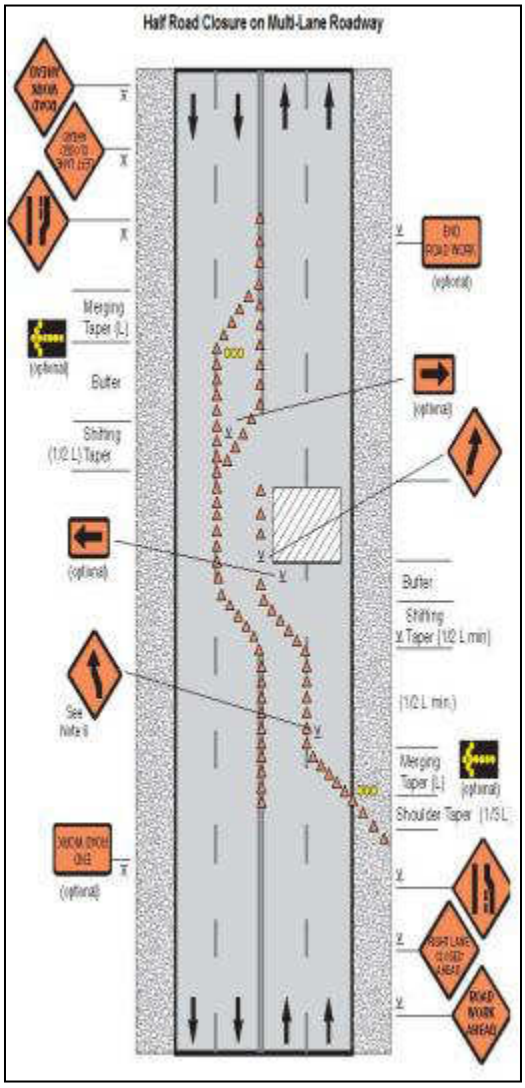
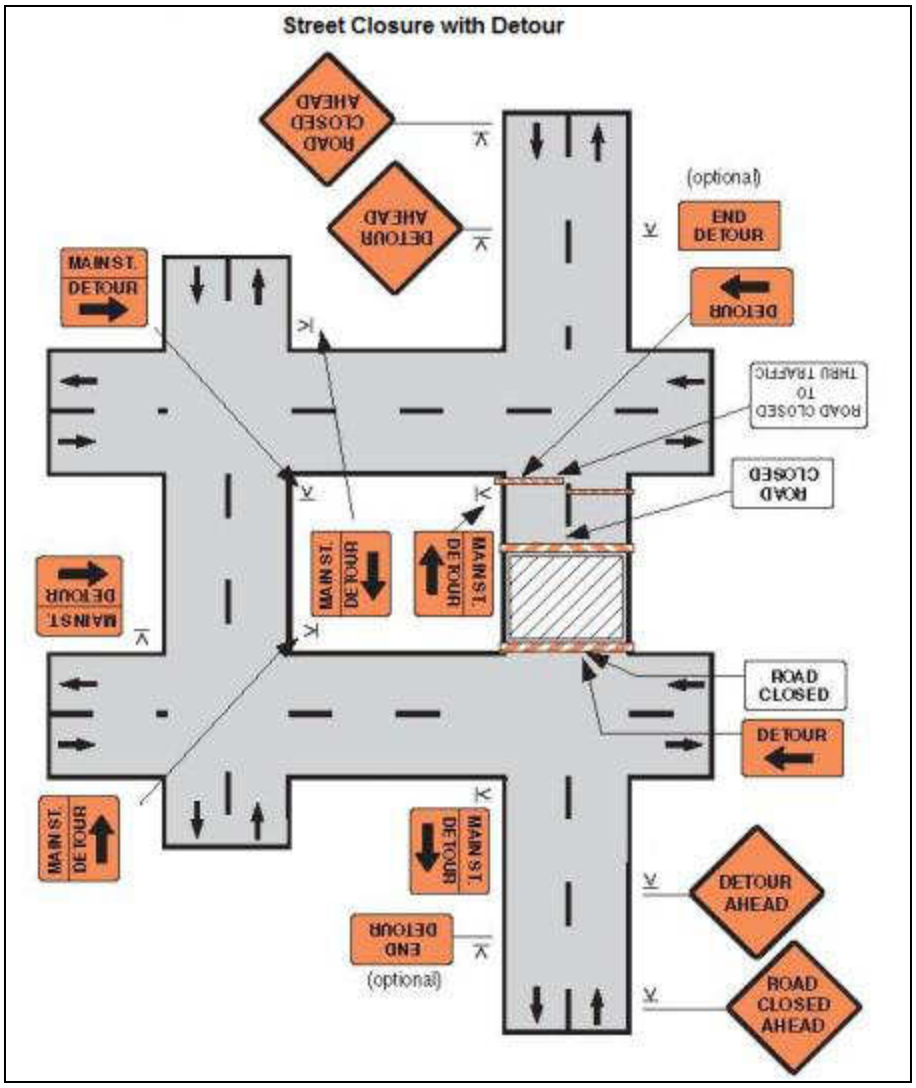

Half Road Closure on Multi-Lane Roadway
END ROAD WORK
(optional)
Merging Taper (L)
(optional)
Buffer
Shifting (1/2 L) Taper
(optional)
Buffer
Shifting Taper (1/2 L min)
(1/2 L min.)
See Note II
Merging Taper (L)
(optional)
Shoulder Taper (1/3 L
(optional)
RIGHT LANE CLOSED AHEAD
ROAD WORK AHEAD

Figure A12: Street closure with detour



Appendix 10. Environmental Disposal Standards

1. General Standards for Discharge of Environmental Pollutants Part - A: Effluents

Parameter	Inland surface water	Public sewers	Land for irrigation	Marine/coastal areas
Suspended solids mg/l, max.	100	600	200	(a) For process waste water (b) For cooling water effluent 10 per cent above total suspended matter of influent.
Particle size of suspended solids	shall pass 850 micron IS Sieve	-	-	(a) Floatable solids, solidsmax. 3 mm (b) Settleable solids, max 856 microns
pH value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
Temperature	shall not exceed 5oC above the receiving water temperature			shall not exceed 5oCabove the receiving water temperature
Oil and grease, mg/l max,	10	20	10	20
Total residual chlorine, mg/l max	1.0	-	-	1.0
Ammonical nitrogen (as N),mg/l, max.	50	50	-	50
Total kjeldahl nitrogen (as N);mg/l, max. mg/l, max.	100	-	-	100
Free ammonia (as NH3), mg/l,max.	5.0	-	-	5.0
Biochemical oxygen demand (3 days at 27oC), mg/l, max.	30	350	100	100
Chemical oxygen demand, mg/l, max.	250	-	-	250
Arsenic(as As).	0.2	0.2	0.2	0.2
Mercury (As Hg), mg/l, max.	0.01	0.01	-	0.01
Lead (as Pb) mg/l, max.	0.1	1.0	-	2.0
Cadmium (as Cd) mg/l, max.	2.0	1.0	-	2.0
Hexavalent chro-mium (as Cr + 6),mg/l, max.	0.1	2.0	-	1.0
Total chromium (as Cr) mg/l, max.	2.0	2.0	-	2.0
Copper (as Cu)mg/l, max.	3.0	3.0	-	3.0
Zinc (as Zn) mg/l, max.	5.0	15	-	15
Selenium (as Se)	0.05	0.05	-	0.05
Nickel (as Ni) mg/l, max.	3.0	3.0	-	5.0
Cyanide (as CN) mg/l, max.	0.2	2.0	0.2	0.2
Fluoride (as F) mg/l,	2.0	15	-	15

Parameter	Inland surface water	Public sewers	Land for irrigation	Marine/coastal areas
max.				
Dissolved phosphates (as P),mg/l, max.	5.0	-	-	-
Sulphide (as S) mg/l, max.	2.0	-	-	5.0
Phenolic compounds (as C6H50H)mg/l, max.	1.0	5.0	-	5.0
Radioactive materials: (a) Alpha emitters micro curie mg/l, max.	10^{-7}	10^{-7}	10^{-8}	10^{-7}
(b)Beta emittersmicro curie mg/l	10^{-6}	10^{-6}	10^{-7}	10^{-6}
Bio-assay test	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent
Manganese	2 mg/l	2 mg/l	-	2 mg/l
Iron (as Fe)	3mg/l	3mg/l	-	3mg/l
Vanadium (as V)	0.2mg/l	0.2mg/l	-	0.2mg/l
Nitrate Nitrogen	10 mg/l	-	-	20 mg/l

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

Standards for Diesel Generator Sets: Stack Height

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

H = h+0.2x ÖKVA

H = Total height of stack in metre

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

KVA = Total generator capacity of the set in KVA

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

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

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

PART-E Noise Standards

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

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

Appendix 11. Operation and Maintenance Plans

A. Institutional Mechanism

A separate Operations and Maintenance Wing is proposed for an effective maintenance of sewerage system. A sewer maintenance crew comprising of a gang leader and four workers shall be set up in each sector comprising 20 km of sewer network for regular cleaning and maintenance of the sewer lines. There will be three such crews under one sewer inspectors. The supervisors report to the Junior Engineer who in turn reports to Assistant Executive Engineer. The Junior Engineer, Sewerage Inspectors and the crew can look after the sewerage, drainage and other solid waste management activities in the town. The Crew works as per the instructions of the supervisors. The supervisors hold the charge of the particular sectors or districts under their jurisdiction and will follow up the works like cleaning of sewers. They shall be assigned the work to take care of the sewerage network and the sewage treatment plant proposed. Care should however be taken to ensure that the debris, brickbats, mortar, etc. is removed immediately after the repair work. A record of daily works done by the sewer maintenance team has to be maintained in a logbook in order to identify the chronic trouble spots, take extra care of these spots and necessary remedial action.

Man power and cost for the maintenance of sewer network

Position	No. of Staff / units	Per month Salary / Cost (Rs)	Total (Rs)
Driver for sewer cleaning vehicle	8	8,000	64,000
Cleaner for sewer cleaning vehicle	24	5,000	1,20,000
Sewer Workers	20	6,000	1,20,000
Sanitary Inspector	2	15,000	30,000
Maintenance of sewer cleaning vehicle (lump sum)	4	25,000	1,00,000
Operating cost of STP	1	50,000	5,00,000
Total (per month)			9,34,000
Total (per year)			11,208,000

B. Sewer System

Quality maintenance shall be the most important step in smooth functioning of the proposed sewers. This includes the optimum use of labour, equipment and material to keep the system in good condition. The following sessions deals with methods of sewer cleaning, staff pattern, organisational set-up for proposed sewerage system and the duties, powers and responsibilities of the staff dealing with proposed system for the town. The following recommendations are made for the smooth maintenance of the sewerage system in the town.

There are three types of maintenance of a sewerage system – preventive, routine and emergency.

1. Inspection and Examination of Sewer

Inspection and examination are the techniques used to gather information to develop operation and maintenance programmes to ensure that new and existing collection systems serve their

intended purposes on a continuing basis. Inspection and testing are necessary to do the following: i) Identify existing or potential problem areas in the collection system ii) Evaluate the seriousness of detected problems iii) Locate the position of problems, and iv) Provide clear, concise, and meaningful reports to supervisors regarding problems.

In order to assess the condition of the sewers inspections and examinations are necessary.

here are two basic types of inspection and examination: Direct and Indirect

a) Direct Inspection and Examination

This means a person walking through a sewer before it is commissioned and physically inspecting the condition visually. This shall never be done once a sewer has been put into service. All safety precautions needed for working in confined spaces shall be taken. The only purpose it will serve will be to get a visual idea of whether the pipe joints are made fully. Once a sewer is put into service, this practice is to be banned forever.

b) In Direct Inspection and Examination

Indirect inspection methods applicable to Indian conditions are i) Light and Mirror ii) Closed Circuit Camera iii) Sonar System.

c) Sewer Inspection and Examination

If an abnormality is detected during preliminary internal inspection or externally noticed from outside, the maintenance engineer should judge the urgency and the content of the abnormality, and then make a proper inspection and study. Commonly adopted methods for detailed examination are i) Visual examination, ii) Manhole visual Inspection, iii) Pole mounted Camera iv)Closed Circuit Television

d) Inspecting Corrosion and Deterioration

The status of deterioration or corrosion within the sewer should be inspected. The materials in the piping facility are of various kinds and hence the corrosion and deterioration conditions vary. Methods for inspecting corrosion and deterioration conditions of a sewer include the following: Inspection by TV camera of the wall surface condition ii) Crack inspection iii) Neutralization test

2. Precautions:

Precautions to be taken during cleaning equipment and machinery for sewers are given below:

When entering manholes, safety measures to be taken during the work include to ensure traffic safety, prevent oxygen deficiency, precautions against hydrogen sulphide etc.

For securing workers' safety, manual sewer/septic tank cleaning should be avoided because persons are likely to come in direct contact with sludge and sewage. Therefore, cleaning machinery and equipment are needed. Furthermore, necessary safety measures before entering manholes for cleaning should be taken.

The contamination of drinking water with sewage may occur when water supply pipe passes through sewer manholes, especially when water supply pipe joints are enclosed in sewer manholes and whenever water supply pipe joints leak, contamination of drinking water supply occurs. As such, water supply pipelines should never be enclosed in a sewer manhole. If any such situation is observed, water supply pipe be made non-functional immediately by stopping flow of drinking water and affected public be supplied clean drinking water by other temporary

means, such as water tankers or laying separate pipe over the ground / road surface and portion of water supply lines lying in sewer manholes be shifted out of manholes.

Special attention should be paid to decentralized sewer system, particularly when small-bore sewer system or shallow sewer system is adopted.

3. SEWER CLEANING

To operate and maintain a sewer collection system to function as intended, the maintenance engineer should try to strive towards the following objectives:

- Minimize the number of blockages per unit length of sewer, and
- Minimize the number of odour complaints.

For this purpose, sewer-cleaning using hydraulic or mechanical cleaning methods needs to be done on a scheduled basis to remove accumulated debris in the pipe such as sand, silt, grease, roots and rocks. If debris is allowed to accumulate, it reduces the capacity of the pipe and blockage can eventually occur resulting in overflows from the system onto streets, yards and into surface waters. Roots and corrosion also can cause physical damage to sewers.

a) Cleaning Equipment and Procedures

Sewer cleaning works require usual implements like pick axes, manhole guards, tripod stands, danger flags, lanterns, batteries, safety lamps, lead acetate paper, silt drums, ropes, iron hooks, hand carts, plunger rods, observation rods, shovels etc.

In addition, sewer cleaning work calls for the following special equipment and devices like a portable pump-set running on either diesel or petrol engine, rope and cloth balls, sectional sewer rods, a sewer cleaning bucket machine, a dredger, a rodding machine with flexible sewer rods and cleaning tool attachments such as augers, corkscrews, hedgehogs and sand cups, scraper, and hydraulically propelled devices such as flush hags, sewer balls, wooden bail and sewer scooters, sewer jetting machine, gully emptiers and pneumatic plugs. The kraite type of flexible rods in a portable reel is useful in attending to house sewers.

The most commonly used cleaning equipments are Manila rope and cloth ball, Sectional Sewer Rods, Sewer Cleaning Bucket Machine, Dredger, Rodding machine with flexible sewer rods, scraper, Jetting machines, suction units and Hydraulically propelled machines like flush bags, sewer balls, sewer scooters.

For detailed guidelines and description of operation and maintenance procedure and equipment refer Manual on Sewerage and Sewage Treatment Systems Part B- Operation and Maintenance 2013, Chapter 2. This can be availed from http://cpheeo.nic.in/Sewerage.aspx

C. Sewerage Treatment Plant and Septic Tank

The following sessions covers the routine operation and maintenance plans for the STP& Septic tank as applicable. The exact method and nature of operation may vary / differ with respect to the model and specification of the machinery and equipment. Therefore, manufacture's manual and hand book should be referred before finalizing these operation and maintenance plans. The operator shall carry out preventive, routing maintenance and break down maintenance operations for proper upkeep of plant in accordance with good operating practices.

1. Daily

A. Sewage Pumping station & Sewage Treatment Plant and Septic Tank

i. Operate the centrifuge for sludge drying and treat incoming sewage at prescribed standards through optimal dosing

ii. Carrying out daily cleaning of grit channels and removal of screenings and disposal of floating matter in grit dewatered sludge out of premises.

iii. Cleaning of the overflow weirs and weekly scarping of the floor and walls of the lauder.

iv. Carrying out continuous flow measurements of treated & untreated sewage and recording the same.

v. Checking the operation, correcting defects related to calibration and setting, minor repairs and proper up keeping such as cleaning for Screens/ Grit Channels, Moving parts of screens and grit removal equipment, Blowers /Agitators / Pumps/ Agitators /Return Sludge pumps/ Chemical mixer/Centrifuge/Decanter, Stuffing box, Bearings, Balancing on Decanter, Chemical dosing and mixing, Motor contact tightness, Cable insulation near the lugs, Panel breaker and starter, contacts of relay and circuit breaker, Setting of over current relay, no-volt coil and tripping mechanism, transformer sub-station, Ground Operated dis-connectors, radiators and earth pit.

vi. Providing security for facilities and system at all times

vii. Ensure continuous power supply, provide necessary power back up.

viii. Ensure the smooth flow into the treatment plant.

B. Daily Reports

i. Daily summary of Operations at Pumping Stations: A daily report providing information at each pumping station, on the hours of pumping quantity of sewage pumped and energy consumed during the day

ii. Daily summary of Operations at Sewage Treatment Plant – A daily report of operation of the diffuses, agitators, decanter and other equipment at the sewage treatment plants providing information on the quantity of sewage treated, hours of operation of equipment, energy consumed and use of chemicals.

2. Monthly

A. Pumping Machinery and Treatment Plant Equipment

i. Checking for damaged pipes, fittings and valves for suction and delivery pipes and replacing / repairing them as required.

ii. Checking pump impellers, body, bearings shafts column pipes and repairing / replacing them if required.

iii. Checking of motors, starters, circuit breakers, capacitors, vanes and/or gears of agitators, transformers, blowers, decanters, diffusers, chlorinator, chemical dosing equipment and centrifuge, and repairing / replacing as required

iv. Calibration, minor repairs and up keeping of Sewerage level indicators in wet well, manholes, wet well interiors and Lighting arrestors.

v. Checking the operation, correcting defects attending to calibration and setting, minor repairs and proper up keeping such as Screen and Grit channels, Chain in mechanically operated components, screen performance, transformer, Oil in transformer, relay alarm circuit, load and voltage

3. Quarterly

A. Pumping Station Complex

i. Checking the pipes and repair /replacing damaged pipes, fittings and valves as required.

ii. Checking the level indicator, lighting conductor etc and replacing / repairing if required.

B. Pumping Machinery and Treatment Plant Equipment

i. Cleaning and maintaining all rising mains/sewers in the plant area.

ii. Checking the operation, correcting defects attending to calibration and setting, minor repairs and proper up keeping such as transformer bushing and dehydrating breathers.

iii. Collecting samples of influent and effluent and analyzing them daily to determine the quality of sewage and performance of the treatment plant

iv. Checking of the walkways for corrosion

v. Conducting Safety audit on routine basis.

C. Quarterly Reports

i. Sewage Quality Monitoring – A quarterly report monitoring the quality of raw and treated sewage through the analysis of samples (Inlet and outlet water quality for BOD/COD/TSS/TKN / TN, TP, Colour etc,)

ii. Testing of the Parameters like testing for MLSS etc. on quarterly basis. .

4. Half Yearly

A. Pumping Station Complex

i. De-silting of wet well and disposing silt.

ii. Pumping Machinery and Treatment Plant Equipment

iii. Dewatering and de-silting of sludge sump, chlorination tank, chemical dosing tanks and disposal of silt.

B. Pumping Station Complex, Wet well, Buildings and other Civil Structures

i. Checking the roof and walls for water proofing.

ii. Checking the operation, correcting defects attending to calibration and setting, minor repairs and proper up keeping such as pumps, blowers, agitators, compressor, decanters, centrifuge, gland of stuffing box, gland bolts, gland packing, alignment of pump aerator and drive, oil lubricating bearings, tripping elements for motor protection, contact points and fuse ratings.

5. Annual

A. Pumping Station and Treatment Complex

i. Checking the ladders and repairs / replacing as required.

ii. Checking for Leakages in structures, ladders, railings, structural damages to the wet and dry well and overflow drain.

iii. Checking the operation, correcting defects attending to calibration and setting, minor repairs and proper up keeping such as paint screens, grit removal mechanism, scrapers, motor pipes, valves, fittings agitators, inlet / outlet weirs.

iv. Carry out routine maintenance and minor repairs including cleaning, repair to plaster doors, windows and painting.

6. Contingency

The contractor need to prepare contingency plans in respect of responses to natural disasters, periods of power failure, storm water inflow into sewers during monsoon, de-silting of units of treatment plants, constraint operations or other similar emergencies to maintain the quality of treated sewage.

7. Energy Audit

The Operator shall take all necessary measures to minimize the power consumption in carrying out its operations. The energy audit operations shall include, but not be limited to the following.

i) Reducing electricity consumption by regulating pumping through suitable modifications to the operating schedules.

ii) Installing more efficient pumping equipment and following better maintenance practices for electrical installation.

For detailed guidelines and description of operation and maintenance procedure and equipment refer

Manual on Sewerage and Sewage Treatment Systems Part B- Operation and Maintenance 2013, Chapter 4. This can be availed from http://cpheeo.nic.in/Sewerage.aspx

Appendix 12. Minutes of the Stakeholder Consultation Meeting

(3rd Aug, 2015, Byadgi)

The meeting was attended by key stakeholders from the project town of Byadgi, including public/elected representatives from town, ULB officials, officials executing agency KUIDFC.The meeting was chaired by Chief Officer, Byadgi, TMC.

The PMDCSC consultants provided details of the overall program, scope of work of sewerage work & STP and environmental and social safeguard issues related to proposed subprojects in town. The benefits of the implementation of the sewerage system for the whole town were explained

Byadgi TMC

- ByadgiChief Officer offered help to resolve issues and to finalise the proposals to improve wastewater systems. He made following comments.
- There is no sewerage system in the town and there is a pressing demand for the UGD system for the town
- People of Byadgi& ULB will co-operate for the smooth implementation of the Project.
- Promised support and coordination during project implementation & Operation and Maintenance of Sewerage system and STP.

Discussions Points

- Provision for Sewer Connections upto property boundary.
- The road cutting if any to be restored to the original condition
- The hygienic situation will improve after the implementation of the sewerage system for the town
- The cost estimates to show following items separately: Laying of sewer network:
- Road restoration cost; Construction of collection chambers and connections from individual properties to collection chambers; and Pumping Stations; Construction cost of WWTP
- Operation and Maintenance of the sewerage system including STP will be done by contractor for a period of six years.

Other Points

- It was clarified that during the sewerage work at-most care will be taken for the protection of utilities. If any damages to the utilities will be carried out immediately
- The construction impacts if any during the construction of sewerage system and STP will be mitigated as per approved environmental monitoring plan
- The road cutting if any will be restored to the original condition.

Byadgi ULB meeting.

Consultation meeting in Byadgi town

Consultation meeting in Byadgi town

At STP site.

KUIDFC-KIUWMIP, Byadagi

Name of the Work: Design, Build and Operate (i) Comprehensive Sewerage System (Sewerage Network), (ii) 5 MLD Sequential Batch Reactor Type Sewage Treatment Plant AND (iii) Operation and Maintenance of the Sewerage Network & Sewage Treatment Plant for a period of Six (6) years for Byadgi Town Municipality in Karnataka

Contract Package No: 01BDG01

Attendance sheet

Sl. No	Name	Designation	Signature
1.	A.G. Gonennavar,	Councillor, Ward -17.	[illegible]
2.	Rohini M.H.	Councillor, Ward - 18	R.M.Hanasthmoned
3.	Sudha K.	Councillor, Ward - 12.	SSK
4.	Shantamma Kaland	Councillor, Ward - 02.	[illegible]
5	V.M. Pujar	C.O. TMC	[illegible]
6	Nirmala.v.Nayak	Junior Engineer	[illegible]
7	Sadanand G.D	Resident Engineer GKW- Consult	[illegible]
8)	Vishal Shenoy.	PMDCSC, GKW Consult	Vishal Shenoy
9)	Neelakshi P.H.	Computer Operator TMC, Byadgi	[illegible]
10)	G.S. Varad	Bill collector TMC, Byadgi	[illegible]
11)	Santosh	Peon, TMC, Byadgi	[illegible]

KUIDFC-KIUWMIP, Byadagi

Name of the Work: Design, Build and Operate (i) Comprehensive Sewerage System (Sewerage Network), (ii) 5 MLD Sequential Batch Reactor Type Sewage Treatment Plant AND (iii) Operation and Maintenance of the Sewerage Network & Sewage Treatment Plant for a period of Six (6) years for Byadgi Town Municipality in Karnataka

Contract Package No: 01BDG01

Attendance sheet

Sl. No	Name	Designation	Signature
1.	S. S. Choti Byadgi 9986577265	local people, Byadgi	S. S. Choti
2.	A. H. Simpager. 9663536254	Local. Resident, Byadgi	[illegible]
3.	Jamaldin. 9964549989.	local resident. Mallur area, Byadgi	[illegible]
4.	B. T. Chandalagi 9164107868	local resident, mallur road, Byadgi	[illegible]
5.	M. C. Bhagoji Koppa 8453521087	local resident Vinayak Nagar, Byadgi	[illegible]
6.	S. S. Baddamane. 9902653336	local resident. medagiri plot, Byadgi	S. S. Baddamane
7.	Kotrappa Baddamane 9945624198	local resident. Gandhi Nagar, Byadgi	KV [illegible]
8.	Veerappa Mallur 9164687719	local resident. Bettadamane, Byadgi	[illegible]
9.	Srikanth Ganappa 9743593105	local resident Ratihalli road, Byadgi	[illegible]
10.	Venkatesh Ningappa 7829054340.	local resident. Shivi colony, Byadgi	[illegible]
11	Santhosh S. Kommu 7676767998	local resident, Ratihalli road, Byadgi	S S Kommu

Attendees list- Byadgi community people

KUIDFC-KIUWMIP, Byadagi

Name of the Work: Design, Build and Operate (i) Comprehensive Sewerage System (Sewerage Network), (ii) 5 MLD Sequential Batch Reactor Type Sewage Treatment Plant AND (iii) Operation and Maintenance of the Sewerage Network & Sewage Treatment Plant for a period of Six (6) years for Byadgi Town Municipality in Karnataka

Contract Package No: 01BDG01

Attendance sheet

Sl. No	Name	Designation	Signature
12.	Maula Ali 9945863260	local resident, Shivapura Badavane, Byadgi	[illegible]
13.	Yallappa. 8095511397	local resident, Shivapura road, Byadgi	[illegible]
14.	Mohammed Ali 9740009986	local resident, Shivapura, Byadgi	[illegible]
15.	Anwar Saab. 9986547031.	local resident, Byadgi	[illegible]
16.	Gadigeppa.	local resident, Idlapur hori, Byadgi	[illegible]
17.	Hema Sdee.	local resident, Idlapur hori, Byadgi	[illegible]
18.	Channabasappa 9591277205	— " —	[illegible]
19.	Sunita Baliger.	local resident, Byadgi	[illegible]
20.	Rekha Channabasappa	— " —	[illegible]
21.	Jayamma.	local resident, Vinayak Nagar, Byadgi	[illegible]
22.	Asif 9980104624	local resident, main road, Byadgi	[illegible]

Attendees list- Byadgi community people

Appendix 13. Monitoring and Reporting Formats

SAMPLE MONTHLY REPORTING FORMAT FOR CONSTRUCTION SUPERVISION SPECIALIST

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 the Sub Project			List of works	Progress of works
		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 the 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 handing 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 µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3
Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3

Noise Quality Results

Site No.	Date of Testing	Site Location	LAeq (dBA) (Government Standard)	
			Day Time	Night Time
Site No.	Date of Testing	Site Location	LAeq (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. Appendices

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

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name
Contract Number
Name: _____ Date: _____
Title: _____ DMA: _____
Location: _____ Group: _____
Weather Condition: _____
Initial Site Condition: _____

Concluding Site Condition:
Satisfactory _____ Unsatisfactory _____ Incident _____Resolved _____ Unresolved _____

Incident:
Nature of incident:
_____

Intervention Steps:
_____

Incident Issues

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

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

Site Restored to Original Condition Yes [ ] [ ]

Signature _____
Name Name
Position Position

SAMPLE CHECKLIST FOR CONSTRUCTION SAFETY

Sl. No.	Safety Issues	Yes	No	Non-Compliance	Corrective Action	Penalty	Remarks
1	Appointment of qualified construction safety officers						
2	Approval for construction safety management plan by the SC						
3	Approval for traffic management/control plan in accordance with IRC: SP: 55-2001						
4	Maintenance of the existing road stretches handed over to the contractor.						
5	Provision of temporary traffic barriers/barricades/caution tapes in construction zones						
6	Provision of traffic signboards						
7	Provision for flags and warning lights						
9	Providing plastic crash barrier						
10	Provision of adequate staging, form work, and access (ladders with handrail) for works at a height of more than 3 m						
11	Provision of adequate shoring / bracing/barricading/lighting for all deep excavations of more than 3 m depth.						
12	Demarcations (fencing, guarding, and watching) at construction sites						
13	Provision for sufficient lighting, especially for night time work						

Sl. No.	Safety Issues	Yes	No	Non-Compliance	Corrective Action	Penalty	Remarks
14	Arrangements for controlled access and entry to construction zones						
15	Safety arrangements for road users/pedestrians						
16	Arrangements for detouring traffic to alternate facilities						
17	Regular inspection of work zone traffic control devices by authorized contractor personnel						
18	Construction workers' safety - Provision of personnel protective equipment						
19	A. Helmets						
	B. Safety shoes						
	C. Dust masks						
	D. Hand gloves						
	E. Safety belts						
	F. Reflective jackets						
	G. Earplugs for labor						
20	Workers employed on bituminous works, stone crushers, concrete batching plants, etc. provided with protective goggles, gloves, gumboots, etc.						
21	Workers engaged in welding work shall be provided with welder protective shields						
22	All vehicles are provided with reverse horns.						
23	All scaffolds, ladders, and other safety devices shall be maintained in safe and sound condition.						
24	Regular health check-up for labor/ contractor's						

Sl. No.	Safety Issues	Yes	No	Non-Compliance	Corrective Action	Penalty	Remarks
	personnel						
25	Ensuring sanitary conditions and all waste disposal procedures and methods in the camps.						
26	The contractor shall provide adequate circuit for traffic flow around construction areas, control speed of construction vehicles through road safety and training of drivers, provide adequate signage, barriers, and flag persons for traffic control						
27	Provision of insurance coverage for the contractor's personnel						

Contractor Consultant

Appendix 14. .Environmental Quality Monitoring at STP

A. Daily Monitoring

No	Tests	Raw Sewage	Primary Clarifier	Aeration Tank	Secondary Clarifier	Outfall	Primary Sludge	Return Sludge	Thickner underflow	Digested Sludge	Sludge Cake
1	Temperature	✓	✓	✓	✓	✓		✓		✓	
2	pH	✓	✓	✓	✓	✓	✓	✓	✓	✓	
3	Alkalinity	✓	✓		✓			✓		✓	
4	BOD (Total)	✓	✓		✓	✓					
5	COD (Total)	✓	✓		✓	✓					
6	TSS	✓	✓		✓	✓					
7	VSS	✓	✓		✓	✓					
8	Residual Chlorine					✓					
9	Moisture Content						✓	✓	✓	✓	✓
10	MLSS			✓							
11	MLVSS			✓							
12	DO			✓	✓						
13	SV_{30}			✓							
14	SVI			✓							
15	Amonia, Nessler	✓		✓		✓					
16	Ortho P, Nessler	✓		✓		✓					
17	Sulphide	✓				✓					

B. Weekly Monitoring

No	Tests	Raw Sewage	Aeration Tank	Outfall	Sludge Cake
1	BOD (Filtered)	✓		✓	
2	COD (Filtered)	✓		✓	
3	Microscopy *		✓		
4	Faecal Coliform			✓	
5	Total Coliform			✓	
6	Oil and Grease	✓		✓	✓
7	Total Residual Chlorine			✓	
8	Ammonical Nitrogen	✓		✓	
9	Total Kjeldahl Nitrogen	✓		✓	
10	Nitrate Nitrogen	✓		✓	
11	Free Amonia	✓		✓	
12	Dissolved Phosphate	✓		✓	
13	Sulphate	✓		✓	
14	Chloride	✓		✓	
15	Silica	✓		✓	
16	Ca	✓		✓	
17	Mg	✓		✓	
18	TDS	✓		✓	
19	Conductivity	✓		✓	

* Microscopy includes Rotifers, Crustaceans, Protozoa, Ciliates, Nocardia, Ceronthirix, Nematodes

Source: CPHEEO Manual on Sewerage and Sewage Treatment Systems

C. Monthly Monitoring

No	Tests	Raw Sewage	Outfall	Sludge Cake
1	Mercury (Hg)	✓	✓	✓
2	Lead (Pb)	✓	✓	✓
3	Cadmium (Cd)	✓	✓	✓
4	Hexavalent Chromium (Cr+6)	✓	✓	✓
5	Total Chromium (Cr)	✓	✓	✓
6	Copper (Cu)	✓	✓	✓
7	Zinc (Zn)	✓	✓	✓
8	Nickel (Ni)	✓	✓	✓
9	Manganese (Mn)	✓	✓	✓
10	Iron (Fe)	✓	✓	✓
11	Vanadium (V)	✓	✓	✓
12	Cyanide (CN)	✓	✓	✓
13	Flouride (F)	✓	✓	✓
14	Phenolic Compounds		✓	✓
15	Arsenic (As)	✓	✓	✓
16	Selenium (Se)	✓	✓	✓
17	Ca		✓	
18	Mg		✓	
19	Na		✓	
20	K		✓	
21	Chloride		✓	
22	SO_4		✓	
23	Alkalinity		✓	
24	CO_2		✓	
25	HCO_3		✓	
26	Bi-assay test	✓	✓	✓
27	Radio Active materials	✓	✓	✓
	(a) Alpha Emitter	✓	✓	✓
	(b) Beta Emitter	✓	✓	✓

Source: CPHEEO Manual on Sewerage and Sewage Treatment Systems