ANDHRA PRADESH URBAN WATER SUPPLY AND SEPTAGE MANAGEMENT IMPROVEMENT PROJECT (APUWS & SMIP)

(UNDER APUFIDC WITH AIIB ASSISTANCE)

PROJECT MANAGEMENT CONSULTANCY SERVICES
IN 50 ULBS OF ANDHRA PRADESH

ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

FOR SULLURUPETA URBAN LOCAL BODY (ULB)

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Acronyms

ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
APPCB	Andhra Pradesh Pollution Control Board
AP SSS	Andhra Pradesh State Sanitation Strategy
APUFIDC	Andhra Pradesh Urban Finance Infrastructure Development Corporation
APUWS&SMIP	Andhra Pradesh Urban Water Supply and Septage Management Improvement Project
BOQ	Billing of Quantity
C&DMA	Commissioner & Director of Municipal Administration
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organization
CPRs	Community Property Resources
DFID	Department for International Development
DI	Ductile Iron
Dia	Diameter
EA	Environment Assessment
EIA	Environment Impact Assessment
ELSRs	Elevated Level Service Reservoirs
EMP	Environment Management Plan
EPA	Environment Protection Act
EPZs	Export Processing Zones
ESMPF	Environmental and Social Management Planning Framework
ESP	Environmental and Social Policy
ESS	Environmental and Social Standards
FRL	Full Reservoir Level

GL	Ground Level
GLBR	Ground Level Balancing Reservoir
GLSR	Ground Level Storage Reservoir
G.O.	Government Order
GoAP	Government of Andhra Pradesh
HDPE	High-density polyethylene
HSC	House Service Connection
IS	Indian Standards
ISO	International Organization for Standardization
JICA	Japan International Cooperation Agency
lpcd	liter per capita per day
MA&UD	Municipal Administration and Urban Development
MDDL	Minimum Drawdown Level
MLD	Million Litre per day
MoEF&CC	Ministry of Environment Forest & Climate Change
MT	metric ton
NEP	National Environment Policy
NGOs	Non- Government Organizations
NUSP	National Urban Sanitation Policy
O & M	Operation and Maintenance
PAPs	Project Affected Persons
PLI	Public Liability Insurance
PMC	Project Management Consultancy
PPEs	Personal Protective Equipments
PUC	Pollution Under Control
QCI-NABET	Quality Council of India - National Accreditation Board for Education and Training

RFCTLARR	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement
ROW	Right of Way
R&R	Resettlement and Rehabilitation
SEZs	Special Economic Zones
SMP	Social Management Plan
SoR	Schedule of Rates
SSR	Social Status Report
STP	Sewage Treatment Plant
TMC	Thousand million cubic feet
UFW	Unaccounted-for-water
ULB	Urban Local Body
WALT	Water, Land and Tree
WTP	Water Treatment Plant
SIA	Social Impact Assessment

EXECUTIVE SUMMARY

About the Project:

The Government of Andhra Pradesh has contemplated several development projects for the improvement of the civic amenities, under the Commissioner & Director of Municipal Administration (CDMA) and the Andhra Pradesh Urban Finance Infrastructure Development Corporation (APUFIDC). The present "Andhra Pradesh Urban Water Supply & Septage Management Improvement Project (APUWS & SMIP)" project for Sullurpeta Municipality is taken up by the Government with the financial assistance from **Asian Infrastructure Investment Bank (AIIB).**

Benefits of the Project:

The project is planned to meet the 135 lpcd regular water supply demand in the base year (2018), prospective year (2033) and ultimate year (2048). The project development works are taken up to fulfill the demand of 13.19 MLD Clear water for the ultimate year (2048) by drawing raw water from reliable source ie Satya Sai Telugu Ganga Canal(KP canal). The project will reduce the burden on the household to collect the water and also improve the health, economic levels and social welfare of the ULB and its surrounding population.

Classification of the Project:

The Overall Project had been assigned Category "A" in accordance with the AIIB's Environmental and Social Policy (ESP) and Environmental and Social Standards (ESS). This subproject is anticipated to have environmental and social impacts and risks that are limited, temporary in nature and reversible consistent with Category B classification. These are depicted as below:

Identified Environmental Impacts and Risks:

The major impacts envisaged in the project are air environment, noise environment, drainage system and solid waste disposal.

i. The dust emissions are significant during excavation of earth for laying pumping mains, construction of water treatment plants and ELSRs. Regular sprinkling of water is suggested as mitigation measure.

ii. Noise is mainly observed during construction and operation phases of the project. During construction phase an adequate Personnel Protective Equipments (PPEs) to be given to all the workers, Provision for compensatory plantation & vegetative barriers are proposed.

iii. The ULB predominantly depends on storm water drains for disposal of domestic waste waters. However, sometimes these storm water drains joins in to nearby water bodies and get the water bodies polluted. A well planned and designed Sewage Treatment plant (STP) is required to protect the water bodies by treating 12.0 MLD of sewage (At present 2.40 MLD and after commission of APUWSSMIP 9.20 MLD of Sewage).

iv. During construction huge amount of debris/ solid waste will be generated, which is about 11.18 MT. Provision for carting of debris is already made in the project cost.

v. During Implementation of the project, the health and hygiene conditions of the local population will be improved significantly and reduction in occurrence of water borne diseases in the area is expected.

vi. The construction of the project will not only provide direct employment opportunities but also ensure the in direct employment through transfer of skills and technical proficiency to the local workforce.

vii. The storage, in-plant handling and dosages of chlorine (bleaching powder), safety of the manpower must be addressed as per the standard procedures and guidelines at State and National level. Periodic and need based training are also required in this regard.

viii. The proposal for provision of 24X7 Water Supply scheme is designed to improve the standard of living of the population in the study area Sullurpeta ULB.

ix. There will be loss of the topsoil and vegetation such as native plants of 16 nos. are required to be removed during laying off the pipelines. Hence it is proposed to preserve the topsoil for future usage and saplings of 80 nos. shall be planted and maintained as per the guidelines.

x. The total budget allocated Environmental implementation of the project is Rs. 28.25 lakhs.

Recommendation:

In total, it is observed that minimum impact on environment is envisaged. A strict adoption of the complete Environment Management Plan with budgetary provision of Rs. 28.25 lakhs may reduce the adverse impacts absolutely to minimal. Hence, this project is **recommended for implementation.**

CHAPTER - 1

1.0 Introduction

Infrastructure projects are generally undertaken to improve the economic and social welfare of the people. At the same time, they may also create an adverse impact on the surrounding environment. People and property in the direct path of the project related areas are affected. The environmental impact of infrastructure projects include damage to sensitive Eco-systems, soil erosion, changes to drainage pattern and thereby groundwater, interference with animal and plant life, loss of productive agricultural lands, resettlement of people, disruption of local economic activities, demographic changes, accelerated urbanization and increase in air pollution. Infrastructure development and operation should, therefore, be planned with careful consideration of the environmental impact. To minimize these adverse effects that may be created by urban infrastructure development projects, the techniques of EIA become necessary.

1.1 Introduction to the overall state-wide project

The Government of Andhra Pradesh has contemplated several development projects for the improvement of the civic amenities, under the Commissioner & Director of Municipal Administration (CDMA) and the Andhra Pradesh Urban Finance Infrastructure Development Corporation (APUFIDC). The present proposed "AP Urban Water Supply & Septage Management Project (APUWS & SMP)" project under which SullurpetaUrban Local Body (ULB) sub project is initiated by APUFIDC, which is a fully owned State Government company under the administrative control of Municipal Administration and Urban Development (MA&UD), Govt. of A.P. The task of preparation of Environment Impact Assessment (EIA) and Environment Management Plan (EMP) for this project has been assigned to **M/s. Aarvee Associates Engineers Architects and Consultants, Hyderabad.**

The proposed Sub project comprises an Intake well, Raw and Clear Water pipelines, Water pumping stations, ELSR and Balancing Reservoir, Water Treatment Plant and Water distribution system to fulfill the drinking water demand of the Sullurpeta Municipality. After careful examination and screening of the nature and scale of the project components, the sub project has been assigned EA category by the AIIB's.

Hence the proposed project requires Environmental Impact Assessment (EIA) report which is to be prepared as per the Environmental and Social Management Planning Framework (ESMPF), as part of the Project Management Consultancy (PMC) services.

1.2 Sub-project justification

It is necessitated at present to have a regular Improvement Water Supply Scheme along with the distribution network for the entire town, drawing water from the dependable source, i.e. Telugu Ganga Canal. In this context the detailed investigation is needed to identify the drawl of water from the Telugu Ganga Canal.

i. There is need for dedicated water supply system for the town.
ii. Need for source identification for the town, i.e. surface water or groundwater, as per the water quality and quantity assessment.
iii. Need for provision of proper treatment facilities.
iv. Need for proper provision of transmission and distribution system for safe and reliable water supply system.

1.3 Requirement for an Environmental Impact Assessment

As per the AIIB guidelines for Environmental and Social policy, the proposed sub project has to undergo Environmental Impact Assessment (EIA) process. As part of the Impact Assessment process, the following aspects are reviewed to find out the suitability and adoptability to this project.

Environmental Impact Assessment (EIA) Notification issued on 14th September 2006 (amended) by the MOEF&CC, Govt., of India that new, expansion or modernization of any activity falling within the 39 categories of developmental and industrial activities shall be undertaken in any part of India only after it has been accorded environmental clearance by the MoEF&CC in accordance with the procedures specified in the notification. Among the 39 categories listed in Schedule -1 of Notification. The proposed water supply service improvement/ up gradation of project in Sullurpeta Municipality neither falls in Category -A nor Category -B of EIA Notification and is exempted from getting Environmental Clearance from MoEF&CC.

However, it is realized that the water supply improvement/ up gradation project of this magnitude needs the EIA/EMP report in order to safeguard the interests of the environment and it will also act as an environmental guide to the Project Proponent & Environment Interested Groups/ NGOs.

Box -1:

i. Category 'A' projects requires prior environmental clearance from Expert Appraisal Committee (EAC), Ministry of Environment & Forests&Climate Change (MoEF&CC), Government of India.

ii. Category 'B' projects require prior environmental clearance from the State Level Environment Impact Assessment Authority (SEIAA), (Category B1 requires environmental impact assessment studies Category B2 not requires EIA Studies).

iii. This Notification suggests that, any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 10 km from the boundary of protected areas, notified areas and inter-state and international boundaries. Also, in the case where a SEIAA does not exist, Category B project will be reviewed by the MoEF&CC and reclassified as Category A.

The Asian Infrastructure Investment Bank (AIIB) operational policies also suggest having an environmental assessment and management plan in all the development projects. However as per the AIIB-ESP and based on screening field observation AIIB classified this project as Environmentally **"A"** category. However this, subproject is Categorized as a "B".

1.4 Objectives of the Project's Environmental and Social Management Planning Framework (ESMPF)

The principal objectives of ESMPF are:

i. The objective of ESMPF is to ensure that the project complies with the National and State environmental regulatory policies and laws, and also with the guidelines and framework of Asian Infrastructure Investment Bank (AIIB) throughout the water supply project life cycle

ii. Generation of Environmental Baseline conditions by considering all the project components including water source, water treatment, and water transmission lines and their allied activities.

iii. An environmental social assessment is to identify the potential and significant environmental impacts (both reversible and irreversible) & analysis.

iv. To quantify the significance of impacts assessed for all the components and its activities.

v. To evaluate the significant impacts on an environmental quality scale. To evaluate possible pollution levels, adopting necessary control/mitigation measures to avoid/ minimize/ abate pollution and prepare Environmental Social Assessment Management Planning Framework (ESMPF) outlining additional control/ mitigation measures to be adopted for mitigation and monitoring of adverse impacts. Integration of EAMF to bid/contract documents and BoQ items for an effective implementation, operation and monitoring.

vi. To prepare a post-project monitoring program and suggesting suitable institutional mechanism for checking and regulating the environmental quality within the limits stipulated by the Ministry of Environment, Forests & Climate Change (MoEF & CC), Government of India.

Andhra Pradesh Urban Financial Infrastructure Development Corporation (APUFIDC), a full owned State Government company under the administrative control of Municipal Administration & Urban Development (MA&UD), Government of Andhra Pradesh has proposed the Urban water supply scheme for sub project Sullurpeta Municipality with the financial assistance from Asian Infrastructure Investment Bank (AIIB).

1.5 Scope of Work for this report

The scope of the environmental report at detailed project report stage is given below:

i. Review national, state and local environmental regulatory requirements on environmental social aspects, including necessary clearances from State and Central Government in the context of construction and operation of proposed project components.

ii. Establishing Environmental baseline covering the scale and specific locations of water supply components including the designated project sites – such as water supply sources, site for locating water off-take, right of way for transmission mains and water treatment plants, storage reservoirs and pumping stations, sites for elevated service reservoirs, distribution network and existing facilities for wastewater disposal.

iii. During screening and categorization of the project components, the following aspects to be considered:

a) Location of the sub-project with respect to environmentally sensitive areas, and community concerns.

b) Volume, nature and technology of construction.

c) Identification of potential environmental and social impacts

iv. Stakeholder consultations Conduct environmental analysis of alternatives for different project components and provide specific inputs to technical analysis of alternatives. The objectives of such analysis shall be to minimize environmental impacts and provide specific inputs to feasibility analysis. Analysis of alternatives shall identify opportunities for environmental enhancements, wherever feasible.

v. To conduct the detailed Environmental Assessment (EA) covering all the components of the projects with supporting primary/ secondary surveys. The environmental assessment shall identify expected environmental impacts (wherever applicable with quantitative / qualitative information) due to the proposed project. The primary surveys shall include source water quality analysis (minimum one week), environmental surveys including identification including addressing the issues of affected people.

vi. of severance, tree cutting schedules and forest diversion proposal (if necessary), and baseline noise quality monitoring at pumping stations.

vii. Prepare a project component specific and implementable environmental management plan to minimize and mitigate environmental impacts. The EMP shall be integrated in to bid/contract documents with necessary contract covenants, technical specifications, and BOQ items for effective implementation. The EMP shall also include implementation and monitoring mechanism, and institutional mechanism and resources required for implementation.

viii. To Prepare an executive summary of EIA and EMP and translate the same into local language to facilitate disclosure.

1.6 Other Legislative and Regulatory Considerations

Applicability of the Environmental Rules and Regulations

The purpose of the Environment Screening is "to determine any significant economic, social and environmental issues, which could require further analysis to resolve such issues". An effort has been made to summarize the screening of environmental & forest rules and regulations, screening with respect to project sub-components and reservoirs location for the water supply improvement project in Sullurpeta Municipality are given in Table 1.1

Table 1.1 Screening of Environmental, Forest Rules and Regulations for Sullurpeta Municipality Improvement Project

Project	Project Components	Applicability of Environmental Laws, Policies and Notifications	Remarks
Water supply works.	• Land Acquisition • Water Bodies • Protected Social	The Environment (Protection) Act, 1986 and further notifications issued under this Act.	Any act during implementation causing damage to environment As per the Environment (Protection) Act (EP) 1986, ambient noise levels are to be maintained as stipulated

Project	Project Components	Applicability of Environmental Laws, Policies and Notifications	Remarks
	Forestry • Sensitive Locations (Schools, hospitals, etc.) • Archaeological Sites		by the Central Pollution Control Board (CPCB) for different categories of areas like, commercial, residential and silence zones, etc., during sub-project construction and operation. Section -3 (2) (iii & iv).
		Water (Prevention and Control of Pollution) Cess Act, 1977 including Rules	Applicable to all activities, which discharge effluents because of process or operations.
		Water (Prevention and Control of Pollution) Act, 1974 – as amended in 1978 & 1988.	Section 3 (2) (a) of the Act and Cess to the Govt. of India as per Table -I & II for consumption of water for domestic, commercial and industrial purposes.
		Forest (Conservation) Act, 1980 – as amended in 1988.	Applicable if the project involves any activities in the reserved forests, village forests, protected forests and other areas as declared by the state Government. Forest Conservation Act –Chapter –2.4 and Chapter – 3.0.

Project	Project Components	Applicability of Environmental Laws, Policies and Notifications	Remarks
		The Ancient Monuments and Archaeological Sites and Remains Act, 1958, as amended in 2010. Ancient Monuments and Archaeological Sites and Remains Rules, 1959.	Not applicable since the all the project site does not contain any Ancient monuments in the alignment.
		Wildlife Protection Act, 1972, amended thereof. The Wildlife (Protection) Rules, 1995.	Applicable incase the project is coming within 10 km radius of Ecological Sensitive areas. The act prohibits picking, uprooting, damaging, destroying, acquiring any specified plant from any forest land. It bans the use of injurious substances, chemicals, explosives that may cause injury or endanger any wildlife.
		Andhra Pradesh Sand Policy, 2016 G.O.Ms.No.29 Dated: 20-02-2016	The act encourages the District level committee to decide the price for the sand based on the proximity, potential and quality. Government will strictly watch and monitor the sand consumption.

Project	Project Components	Applicability of Environmental Laws, Policies and Notifications	Remarks
		Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016	Very partly applicable for storage, handling and usage of the emulsified oils, colours and cotton waste used in the project during construction and operation phase of the project.
		The Public Liability Insurance Act, 1991.	Act enables the people to access legal aid to claim compensation in the event of an accident occurred while handling any hazardous substance. So, insurance needs to be taken up by the project implementing agencies or contractors. PLI Act: Act 6 of 1991 as amended by Act 11 of 1992.
		Ministry of Environment Forests & Climate Change (MoEF&CC) EIA Notification (New) issued on 14th September, 2006 and subsequent amendments thereof till date.	Not Applicable. Project proponent must satisfy the air, water and noise Prevention and Control Acts during construction and operation phase of the project. The EIA Report should be prepared as per the AIIB guidelines.

Project	Project Components	Applicability of Environmental Laws, Policies and Notifications	Remarks
		Noise Pollution (Regulation and Control) Rules, 2000	Applicable Under Rule 3(1) & 4 (1) - Clause 2, 3 & 6.
		Land Acquisition Act 1894; Land Acquisition Act 1989 & RFCTLARR Act, 2013.	Applicable. To set out rules for the acquisition of land by Government.
		Motor Vehicles Act, 1988 Rules of Road Regulations, 1989	To check all the vehicles operating during construction activity are having PUC certificates.
	Tree removal and Plantation	Andhra Pradesh Water, Land and Tree Act, 2002 and Rules 2004.	Yes. Adequate permission is needed to obtain from concerned for utilisation of water, tree cutting and land acquisition in the project.
	Construction and demolition waste	Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016	The construction and demolition wastes must be disposed in designated or identified low lying areas only.
	Domestic Solid Waste	Solid Waste Management Rules, 2016	The municipal solid waste should be segregated at the source followed by the proper collection, treatment and disposal. This way the water bodies will be prevented from getting polluted by the municipal solid waste.

Detailed explanation for these applicable acts and clearances are given below:

Constitutional Guarantees

a) Article 48-A of the Constitution: This directive principle states that the State shall endeavor to protect and improve the natural environment
b) Article 51-A of the Constitution: This fundamental duty states that it is the duty of every citizen to protect and improve the natural environment. Courts have tended to enlarge the scope of fundamental rights so that environment dimensions are recognised.

The Water (Prevention and Control of Pollution) Act, 1974

The above Act, 1974 suggest that only State Governments can enact water pollution Legislation. Article 252 empowers Parliament to enact laws on state subjects for two or more states, where the State Legislatures have consented to such legislation. Under this Act, the State Boards were vested with the regulatory authority and were empowered to establish and enforce effluent standards for factories discharging pollutants into bodies of water. A Central Board performs the same functions for union territories and coordinates activities among the states.

The PCBs established under the Water Act, control sewage and industrial effluent discharges in the water bodies by approving, rejecting or conditioning applications for consent to discharge.

The Water (Prevention and Control of Pollution) Cess Act of 1977

The main object of this Act is to meet the expenses of the Central and State Water Boards. Economic incentives are provided for control of pollution by differential levy of tax structure. The local authorities and certain designated industries are required to pay a cess for water consumption. The revenues accruing thus are in turn used for Implementation of the Water (Prevention and Control of Pollution) Act, 1977. The Central Government, after making deductions for collection expenses, pays the Central board and the States such sums as it deems necessary to enforce the provisions of the Water (Prevention and Control of Pollution) Act, 1974. On the installation of effluent treatment equipment and meeting the applicable norms the polluter is entitled to get a rebate of 25% on applicable cess.

Air (Prevention and Control of Pollution) Act 1981

The objective of this Act is to provide for the prevention, control and abatement of air pollution, for the establishment, with a view to carrying out the aforesaid purposes, of Boards, for conferring on and assigning to such Boards powers and functions relating thereto and for matters connected therewith.

Noise Control Rules 2000

The objective of these rules, is to regulate and control the ambient noise levels in public places from various sources inter–alia industrial activity, construction activity (fire crackers, sound producing instruments) gen sets, loud speakers, public addressing system, vehicular horns and other mechanical devices have deleterious effects on human health and psychological wellbeing of the people, it is considered necessary to regulate to regulate and control the ambient noise levels.

The Environment (Protection) Act, 1986 (EPA)

According to EPA, "Environment" includes water, air and land and the interrelationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property; Section 3 of the EPA states, that Central Government shall have the power to take all such measures as it deems necessary or expedient for the purpose of protecting and improving the quality of the environment and preventing controlling and abating environmental pollution.

National Environment Policy, 2004

The National Environment Policy (NEP, 2004) is a response to the national commitment to a clean environment, mandated in the Constitution in Articles 48A and 51 A (g), strengthened by judicial interpretation of Article 21. The Objective of NEP 2004 is:

i. Conservation of Critical Environmental Resources
ii. Intra-generational Equity: Livelihood Security for the Poor

Solid Waste Management Rules, 2016

Every municipal authority shall, within the territorial area of the Municipality, be responsible for the implementation of the provisions of these rules, and for any infrastructure development for collection, storage, segregation, transportation, processing and disposal of municipal solid wastes.

Clearances

Forest Clearance:

If there is no forest exists in the project area and no trees are disturbed due to construction activity of laying Pipeline, no permission is required from concerned authorities. However, in case the proposed project activities cover the forest areas, it will need the Forest Clearance.

Other Clearances*:* Implementing agency shall ensure that the following clearances before commencement of providing Water supply pipeline.

a) Clearance from Highways Department for cutting roads.
b) Permission for breaking or shifting of public utilities like sewer lines or water pipelines from Municipality.
c) Permission and clearance from Electricity board for shifting/ moving of streetlights, cables etc.

CHAPTER - 2

PROJECT LOCATION AND BASELINE DATA

2.0 Project Location

Sullurpeta Municipality is in Nellore District. It is the Mandal Headquarters for Sullurpeta Mandal. Sullurpeta is a 3rd grade Municipality by merging the Sullurpeta Panchayat and its hamlet villages. It is the gateway of SHAR, Sriharikota High Altitude range and often called Rocket town.

Sullurpeta Municipality is located in SPSR Nellore District and it is Gateway to "INDIA SPACEPORT" commonly called as "Satish Dhavan Space Centre, Sirharikota High altitude Range (SHAR)' which is about 17 km distance from Sullurpeta.

It is considered a suburb of Chennai due to its proximity, since it is just 83 Km away from the place and has excellent rail and road connectivity to Chennai. It is 85Km from Nellore City. It is 80 Km from Tirupati - Tirumala. Sullurpeta is at a distance of 12 Km from Siricity which is a developing satellite township in the epicenter of Andhra Pradesh & Tamilnadu.

The Municipality is classified as 3rd Grade Municipality having 23 wards surrounded by the Agriculture Lands. The Kalangi River is passing through the Town. The Telugu Ganga Canal (KP Canal) is passing about 20 Km from the town and it is the main source for providing Water Supply to the town. The town is well established with Educational & Commercial Institutions and Local Markets. This Town is also a Mandal Head Quarter. The Town is fast developing due to the agriculture activity in surrounding areas.

The population of the Town is 45,836 as per 2011 census. It is observed, there is fast growth in population due to Agriculture Market, Educational & Commercial Institutions and also Mandal Head Quarter.

2.1 Baseline Data

Environmental baseline conditions shall provide an overall description of the existing environmental conditions on all project components, including water source, clear water sump, and water

transmission alignments, and their project activities. Studies are undertaken to generate baseline data within a 10 km radius study region around the proposed project site on such environmental parameters as air quality, ground and surface water quality, noise levels, land environment including geomorphology, land-use pattern, forest cover, biological environment and socio-economic status of the population, etc. From these inputs, environmental screening of project will be identified based on the field conditions.

Site and its Surroundings

Topography & Salient Features

Name of the Town	: Sullurpeta Municipality
District & State	: Nellore, Andhra Pradesh
Geographical Location	: Latitude: $13^0$70'00" North
	: Longitude: $80^0$01'67" East
Avg Elevation	: Varies from + 11.00 M
Area of the Town	: 17.68 Sqkm
Population as per 2011 census	: 45,836

2.1.1 Geographical & Demographic characteristics

Sullurpeta Municipality is located in SPSR Nellore District and it is Gateway to "INDIA SPACEPORT" commonly called as "Satish Dhavan Space Centre, Sirharikota High altitude Range (SHAR)' which is about 17 km distance from Sullurpeta.

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Characteristics of the Sullurpeta Municipality

The Municipality is classified as 3rd Grade Municipality having 23 wards surrounded by the Agriculture Lands. The Kalangi River is passing through the Town. The Telugu Ganga Canal (KP Canal) is passing about 20 Km from the town and it is the main source for providing Water Supply to

the town. The Town is well established with Educational & Commercial Institutions and Local Markets. This Town is also a Mandal Head Quarter. The Town is fastly developing due to the Agriculture Activity in surrounding areas.

Demography

The population of the Town is 45,836 as per 2011 census. It is observed, there is fast growth in population due to Agriculture Market, Educational & Commercial Institutions and also Mandal Head Quarter.

Table 2.1 Sullurpeta Municipality at a Glance

General		**Drains - Pucca**	: Kms
Area	: 17.68Sqkm	Kutcha	: 27.0Kms
Population as per 2011	: 45836	Storm Water Drains	:35.0 Kms
No of Houses	: 14456	**Sanitation**	
No. of Municipal Wards	: 23	Garbage generated per day	: -----
Yearly Income (incl. Grants)	:86.17 Lakhs	Garbage lifted per day	: --------
Total Slum Population	12042	**No of Municipal Schools**	
Streetlights		High School	: 10
SV Lamps	274 No.s	Upper Primary	: 12
Solar Lamps	Nil	Primary Schools	12
Florescent Lamps	850 No.s	**Collages**	6
Infrastructure		Private Engineering Collages	2
Water Supply		**Roads**	
Present Water Supply	42 LPCD	CC Roads	33Kms
Total Quantity supply daily	1900 KL	BT Roads	: 11.0Kms
Total no. of ELSR's	7	WBM Roads	8.0Kms
Total no. of MPWS Scheme	8	Others	: 30.Kms
Total no. of Hand Bore wells	47	Total	: 82Kms

Drainage

The town has no proper drainage system. The main roads of the town are provided with side drains and the drain water is let into Fields. In the absence of adequate drainage system and proper disposal arrangements the sullage water of the town is stagnated in many areas of the town creating mosquito menace.

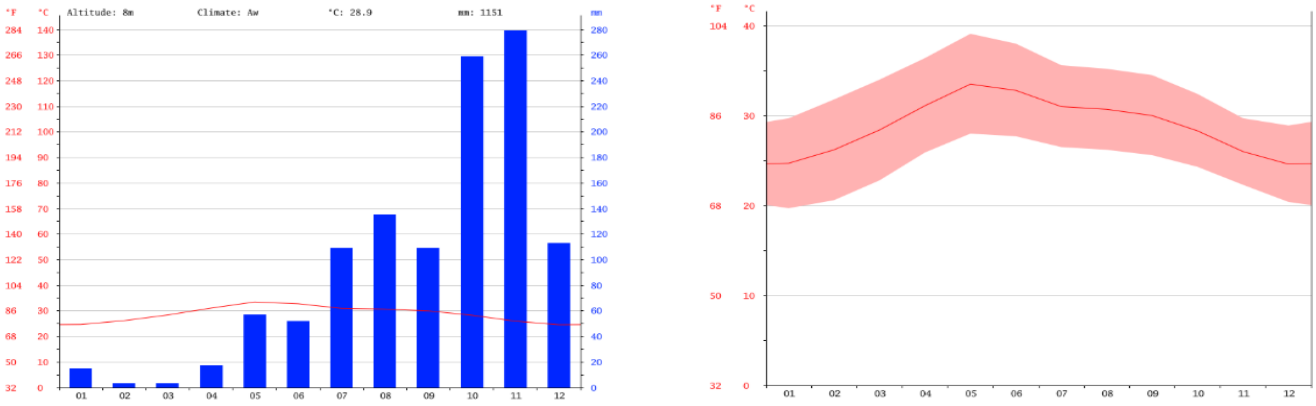
Seismic Details of the Area

As per the District Disaster Management Plan for Kurnool district prepared by District administration with the support of United Nations Development Program, India, the project district falls in Zone II (least active seismic zone) and Zone III (moderate seismic zone) as per the latest Seismic Zoning Map of India. 80% of the total area and 55% of the total population of the district falls in Zone II; while 20% of the total area and 45% of the total population falls in Zone III. The project area however falls in 'least active seismic zone'.

2.1.2 Meteorology of Sullurpeta

Temperature, Rainfall

Figure 2.1 Month wise rainfall and temperature details



(Source: https://en.climate-data.org/asia/india/andhra-pradesh/Sullurpeta-172386/)

The climate here is tropical. When compared with winter, the summers have much more rainfall. The climate here is classified as Aw by the Köppen-Geiger system. In Sulurupetta, the average

annual temperature is 28.9 °C. The average annual rainfall is 1151 mm. The driest month is February, with 3 mm of rain. In November, the precipitation reaches its peak, with an average of 279 mm. May is the warmest month of the year. The temperature in May averages 33.5 °C. At 24.6 °C on average, December is the coldest month of the year. The graphical representation of month wise rainfall and temperature are placed in Figure 2.1 and overall month wise details were placed in Figure 2.2.

Sullurpeta monthly weather averages

Figure 2.2 Month wise rainfall and temperature details

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	24.7	26.2	28.4	31.1	33.5	32.8	31	30.7	30	28.3	26	24.6
Min. Temperature (°C)	19.7	20.6	22.8	25.9	28	27.7	26.5	26.2	25.6	24.3	22.3	20.4
Max. Temperature (°C)	29.7	31.8	34	36.4	39.1	38	35.6	35.2	34.5	32.4	29.7	28.9
Avg. Temperature (°F)	76.5	79.2	83.1	88.0	92.3	91.0	87.8	87.3	86.0	82.9	78.8	76.3
Min. Temperature (°F)	67.5	69.1	73.0	78.6	82.4	81.9	79.7	79.2	78.1	75.7	72.1	68.7
Max. Temperature (°F)	85.5	89.2	93.2	97.5	102.4	100.4	96.1	95.4	94.1	90.3	85.5	84.0
Precipitation / Rainfall (mm)	15	3	3	17	57	52	109	135	109	259	279	113

Source: https://en.climate-data.org/asia/india/andhra-pradesh/Sullurpeta-172386/

There is a difference of 276 mm of precipitation between the driest and wettest months. The variation in annual temperature is around 8.9 °C.

The primary baseline information on different environmental components were collected through field survey. Field survey were carried out to collect information on the major environmental features such as settlement facilities, drainage pattern of the area, forest, trees within RoW of the alignment of pipeline, water bodies, river crossing, sensitive receptors, air, water, noise and soil quality etc. and were studied in detail, which helped in identifying areas of concern along the stretch and critical issues. Consultation with the local officials and public were carried out also on the salient environmental features of the project area.

Further primary samples surveys for the environmental components, such as air, surface water, noise and soil characteristics that are critical in the context of the project were carried out. The pre-monsoon season monitoring was carried out in the months of May to June 2019.

Ambient Air Quality: Ambient air monitoring stations were established at various locations along the project section accessing the ambient air quality in the project area. The air quality parameters considered for the study included Particulate Matter (PM_{10}), Particulate Matter ($PM_{2.5}$), Nitrogen oxides (NO_x), Sulphur dioxide (SO_2), and Carbon Monoxide (CO). The criteria for the selection of sampling sites were based on type of activity, residential, commercial, traffic congestion, urban centers, location of sensitive receptors etc. 24-hourly monitoring was carried out twice in a week for one season.

Water Quality: Grab samples were collected from River Krishna and farm ponds/lakes in the study area of Sullurpeta to assess the surface water quality in the project area. Ground water samples were collected from hand pumps. The water samples were tested for different physico-chemical parameters such as dissolved oxygen, total alkalinity, pH, conductivity, TDS, BOD, COD, etc. using standard methods (APHA, 1998). Bacteriological quality of the water was tested using the membrane filter method (APHA, 1998).

Soil Quality: The composite soil samples were collected from different locations in the study area. They were analyzed for relevant physico-chemical parameters using standard analytical methods (Allen, 1989; Anderson and Ingram, 1993; Rowell, 1994) to assess the soil quality of the area.

Noise Level: 24 hourly ambient noise level was measured using noise level meter at various key locations of study area during day and nighttime. The selection of sampling locations was based on land use & categorization of the study area. The noise levels have been expressed as an equivalent noise level (Leq), which is the measurement of sound pressure level as the logarithmic averaging time.

Flora and Fauna Study: A list of all macroscopic plants and animals is prepared based on field survey covering the entire project site or core area. If any species cannot be identified, photos of the plant and plant parts are taken, and a field note is prepared on the plant for subsequent identification. Data related to the faunal species is collected from secondary data. Data from field study is recorded the total Floral species are : 53 species for trees, 5 for climbers, 7 for shrubs, 11 for Herbs, 2 for Cactus and 6 species for grasses. Data from field study is recorded the total Faunal

species are : 16 species for Mammals, 52 for Birds, 9 for Reptiles, 4 for Amphibians and 3 species of Fishes.

2.1.3 Air Quality

After a preliminary reconnaissance of the study area and taking into account of major activities in water supply system & up gradation proposals, it is concluded that no major source of air pollution exists in the project area. The other sources identified for air pollution are local traffic, small scale industries and domestic emissions. Ambient air quality in the study area is collected from the two monitoring locations for the assessment of the air quality. The list of air quality monitoring stations in the Sullurpeta Municipality is given in the Table 2.2 and the analysis results of the monitoring were placed in Table 2.3. The photographs pertaining to the monitoring were placed as Figure 2.3.

Table 2.2 Ambient Air Quality Monitoring Locations

Location	Name of the Location
AQ-1	Near WTP Area Mangalampadu, Sullurpeta
AQ-2	Near Harijanawada Sullurpetaa 300 KL ELSR.

Figure 2.3 Ambient Air Quality Monitoring Locations in Sullurpeta

Table 2.3 Ambient Air Quality sample analysis for Sullurpeta

S.No.	Parameter(s)	Units	Results Obtained (Range)	NAAQ Standard
1	Sulphur Di-oxide (SO_2)	$\mu g/m^3$	5.4-7.4	80 (24 Hours)
2	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	9.3-15.0	80 (24 Hours)
3	Particulate Matter size Less than 10 µ	$\mu g/m^3$	36.8-46.3	100 (24 Hours)
4	Particulate Matter size Less than 2.5 µ	$\mu g/m^3$	17.5-24.1	60 (24 Hours)
5	Carbon Monoxide	mg/m^3	<1.0	4 (1 Hours)

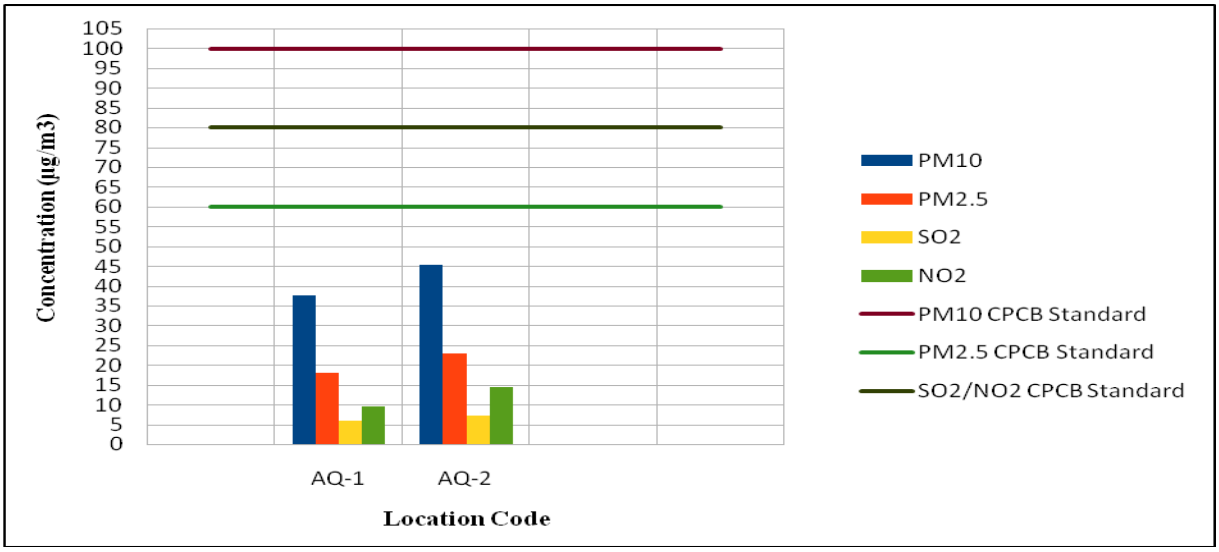
Note: - 1. The standards for RPM, SO2 and NO2 are adopted from NAAQ Standards 2009.

Results and Discussions:

It is observed from the analysis of Ambient Air quality in the study area As can see from the above Table, The PM_{10}, Sulphur Di-oxide and Oxides of Nitrogen values are well within the stipulated standard of 100 & 80 $\mu g/m^3$ respectively.

The graphical representation of the analysis results are placed in the Figure 2.4

Figure 2.4 Graph showing the analysis results of Ambient Air Quality Monitoring at Sullurpeta



2.1.4 Noise Pollution

Keeping in view of the proposed up-gradation of water supply system in Sullurpeta Municipality area, the field monitoring of noise level was carried out at four (04) locations. The locations were given below. Precision integrating sound level meter having statistical unit with digital display was used for ambient noise level monitoring. Instantaneous noise quality monitoring was carried out at selected locations. The noise quality monitoring locations and the recorded noise levels are given in Table 2.4.

Table 2.4 Noise Quality Monitoring Locations and the recorded values

Code No.	Category	Name of the location	Day time Noise level dB(A)	Standard for Leq Day dB(A)	Night time Noise level dB(A)	Standard for Leq Night dB(A)
N-1	Residential	Near Opp Bharath Petrol Pump Harijanawada Sullurpetaa.	57	65	45.6	55
N-4	Residential	Near WTP Area Mangalampadu, Sullurpetaa	50.2	65	39	55
N-2	Commercial	Near RTC Bus stand Sullurpetaa	58.9	65	44.6	55
N-3	Commercial	Near kalakshatram ELSR 1200 KL	54.3	65	42.2	55

Results and Discussions:

The noise levels are observed at various locations covering all the project sub-components in the water supply scheme. At all the locations, the noise levels are found to be consistent. The graphical representation of the Noise quality recorded in the residential category monitoring locations are placed as Figure 2.5 and the commercial category monitoring locations are placed as Figure 2.6.

Figure 2.5 Graph showing the analysis results of Noise levels at Residential category locations of Sullurpeta

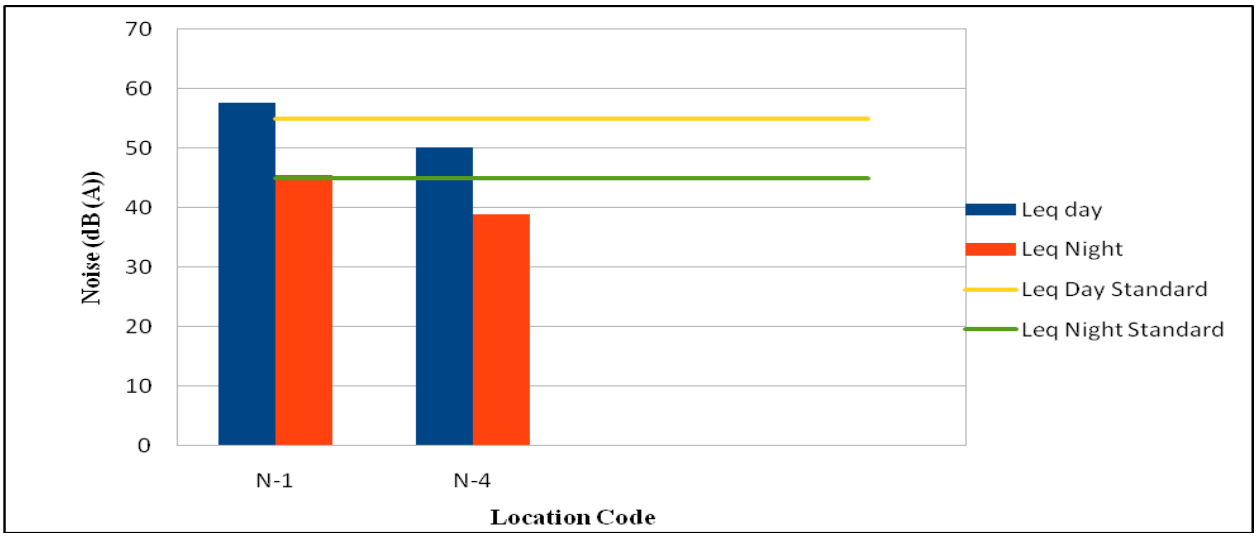
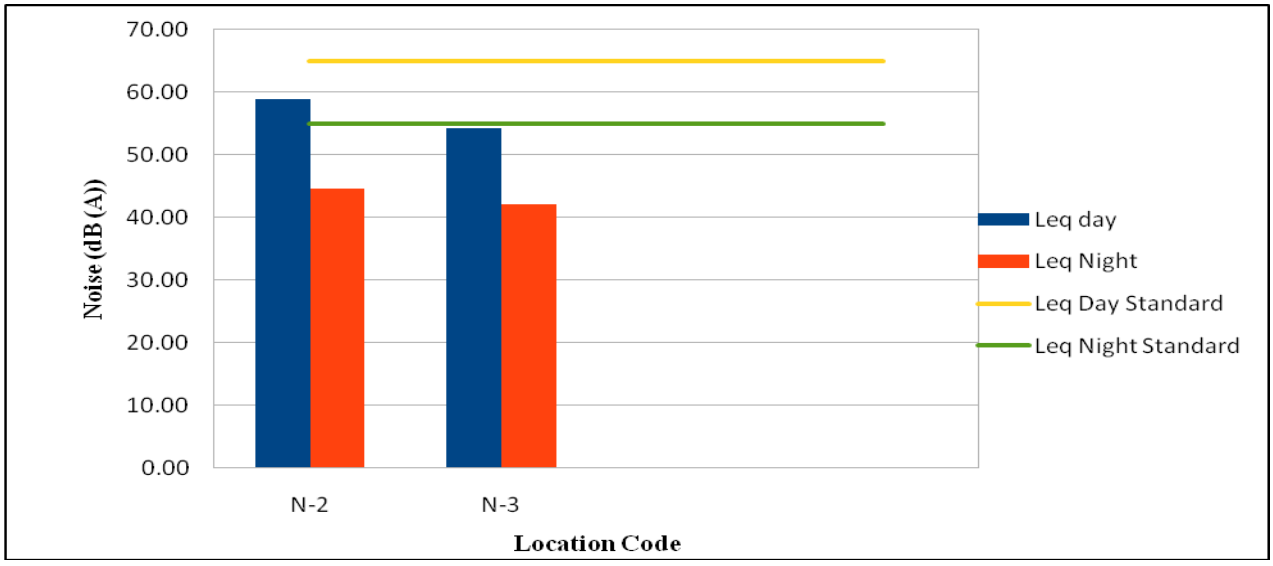


Figure 2.6 Graph showing the analysis results of Noise levels at Commercial category locations of Sullurpeta



2.1.5 Water Quality

Drinking water standard parameters as per IS: 3025 standards have been selected for analysis of physico-chemical and bacteriological indicators of pollution which will be used for describing the

baseline status of water environment. Generation of baseline data for water quality covers surface water sources. The major water source for Sullurpeta Municipality and environmental issues related to water quality in the study area are given in Table 2.5.

Table 2.5 Major Environmental Issues Related to Water Quality Assessment

S. No.	Environmental water quality related issues	Status
1	Surface water quality sources	Satya Sai Telugu Ganga canal(KP Canal)
2	Ground water sources	Bore wells, tube wells, dug wells (Majority of water is used for irrigation purposes and very less quantity of water used for drinking)
3	Environmental issues in respect of current water supply sources.	In general, the water qualities of the various sources are observed to be good and no major environmental issues are involved from the current sources.
4	Upstream pollution points for the current sources,	No pollution sources are observed.
6	Any pending Public Interest Litigation (PIL) on existing water supply system.	No

2.1.6 Source sustainability

Sustainable development implies the fulfillment of preserving the overall balance, concern for the environment, and preventing the exhaustion of natural resources. The evaluation of "sustainability of water supply sources" is essential as it details the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability assessment (SA) is conducted for supporting decision-making and policy in a broad environmental, economic and social context, and transcends a purely technical/scientific evaluation.

Water flows in to a reservoir is a renewable resource. The cycle must be harnessed so that the project continues to generate benefits such as irrigation, flood control, water supply etc. for a long period, certainly decades, preferably a hundred years or more. In the narrow sense, sustainability means the hydro's lifetime should be as long as possible. In the broad sense, sustainability means environmental and social damage has been prevented or offset such that net residual impacts are

insignificant. In particular to sustainability of water source system is the maintenance of desired quantity and acceptable quality standard of water supply services throughout the design life may be considered as sustainability.

For Sullurpeta ULB, Government of Andhra Pradesh had accorded permission to allocate and draw 0.25 TMC of water in KP Canal for drinking water needs of the Sullurpeta Municipality. This permission was issued to meet the drinking water needs as the drinking water needs is first charge. The relevant Government Orders Water Resources (WRG-GRC) Department G.O.R.T.No. 485 issued on Dated: 22.09.2020, is presented at **Annexure-I.** The source sustainability report, Hydraulic flow Particulars incorporated as **Annexure-II**.

2.1.7 Surface Water Quality

During field visits to the study area, water samples have been collected at existing & proposed water supply sources like river /canals, clear water sump locations and distribution network locations for assessing the water quality. The sampling locations are designated as SW is listed in Table. These locations were identified considering proximity to the project site, their activities and depending upon their utility by the people in the study area. As a part of the primary surveys, the samples were collected in the month of June2019 and the samples were analyzed at the NABL approved laboratory. The details of the surface water sampling locations are given in Table 2.6. The surface water sample SW-1 represents the water quality of the Source as the location of the sample is upstream of Telugu Ganga canal which is about 1 km.

Table 2.6 Surface water quality sampling locations

Code No.	Name of the location
SW-1	Near Mannarpolur 900KL ELSR
SW-2	Near Kalangi Rivar Sullurpetaa
SW-3	KP Canal Sullurpetaa (Dry)

The photographs showing the samples collection are given in Figure 2.7. The results of the water samples analysis are given in the following Table 2.7.

Figure 2.7 Surface water sampling in Sullurpeta

Table 2.7 Surface Water Quality analysis results in the study area

S.No	Parameter	Units	Test Method	SW-1	SW-2	SW-3	IS:2296 Class C Limits	IS 10500:2012 Permissible Limits
1	pH at 25 ^{o}C	-	IS:3025 (Part 1) 1983	8.42	7.86	8.40	NR	6.5 – 8.5
2	Color	Hazen	IS:3025 (Part 4) 1983	150	400	100	15	300
3	Conductivity at 25 ^{o}C	µS/cm	IS:3025 (Part 4)1984	2208	1845	1702	--	--
4	Turbidity (NTU)	NTU	IS 3025 (Part 10) 1984	46.6	158	36.4	5	--
5	Total Dissolve solids	mg/L	IS:3025 (Part 16) 1984	1504	1275	1173	2000	1500
6	Total Hardness as $CaCO_3$	mg/L	IS 3025 (Part 21) 2009	1240	170	370	600	--
7	Total Alkalinity	mg/L	IS 3025 (Part 23) 1986	250	220	350	600	--
8	Calcium as Ca	mg/L	IS 3025 (Part 40) 1991	24	80	80	200	--
9	Magnesium as Mg	mg/L	IS 3025 (Part 46) 1994	43.2	28.8	40.8	100	--
10	Chloride as Cl	mg/L	IS 3025 (Part 32) 1984	425	265	280	1000	600
11	Sulphate as SO_4	mg/L	IS 3025 (Part 24) 1986	230	298	86.4	400	400
12	Fluorides as F^-	mg/L	IS 3025 (Part 60) 2008	0.52	0.62	0.56	1.5	1.5
13	Nitrates as NO_3	mg/L	IS 3025 (Part 34) 1988	9.2	11.0	9.1	NR	50
14	Sodium as Na	mg/L	IS 3025 (Part 45) 1993	392	341	214.6	--	--
15	Potassium as K	mg/L	IS 3025 (Part 45) 1993	3.7	3.5	4.5	--	--
16	Iron as Fe	mg/L	IS 3025 (Part 53) 2014	0.12	0.12	0.16	NR	0.5
17	Zinc as Zn	mg/L	IS 3025 (Part 49) 1994	0.030	0.012	0.026	15	15.0
18	Chemical Oxygen Demand	mg/L	IS 3025 (Part 58) 2006	70	410	60	--	--
19	Silica as SiO_2	mg/L	IS 3025 (Part 35) 1988	4.8	6.4	6.4	--	--
20	Temperature at site	^{o}C	IS 3025 (Part 9) 1984	26.3	27.1	26.2	--	--
21	Total Suspended Solids	mg/L	IS 3025 (Part 17) -1984	72.4	80.4	26.7	--	--

S.No	Parameter	Units	Test Method	SW-1	SW-2	SW-3	IS:2296 Class C Limits	IS 10500:2012 Permissible Limits
22	Ammoniacal Nitrogen as N	mg/L	IS 3025 Part 34 -1988	0.24	0.42	0.18	--	--
23	Total Kjeldahl Nitrogen	mg/L	IS 3025 Part 34 -1988	2.12	2.60	1.96	--	--
24	Dissolved Oxygen	mg/L	IS 3025 (Part 38) 1989	3.2	3.0	3.4	--	≥4.0
25	Biochemical Oxygen Demand	mg/L	IS 3025 (Part 44) 1993	22	140	18	--	≤3.0
26	Phosphate as PO_4	mg/L	IS 3025 (Part 31) 1988	<0.02	<0.02	<0.02	--	--
27	Oil & grease(max)	mg/L	IS 3025 (Part 39) 1991	<0.1	<0.1	<0.1	--	0.1
28	Phenolic Compounds(max)	mg/L	IS 3025 (Part 43) 1992	<0.001	<0.001	<0.001	0.002	0.005
29	Boron as B(max)	mg/L	IS 3025:(Part-57) 2005	0.016	0.060	<0.001	1.0	--
30	Lead as Pb(max)	mg/L	IS 3025 (Part 47) 1994	<0.001	<0.001	<0.001	NR	0.1
31	Arsenic as As(max)	mg/L	IS 3025 (Part-37) 1988	<0.001	<0.001	<0.001	0.05	0.2
32	Mercury as Hg(max)	mg/L	IS 3025(Part-48) 1994	<0.0001	<0.0001	<0.0001	NR	--
33	Cadmium as Cd(max)	mg/L	IS 3025 (Part 41) 1992	<0.001	<0.001	<0.001	NR	0.01
34	Manganese as Mn(max)	mg/L	APHA 23rd Ed 3111-B	<0.001	<0.001	<0.001	0.3	--
35	Total Chromium(max)	mg/L	IS 3025 (Part 52) 2003	<0.001	<0.001	<0.001	NR	0.05
36	Copper as Cu	mg/L	IS 3025 (Part 42) 1992	0.068	0.092	0.102	1.5	1.50
37	Coliform	MPN/100 ml	APHA 23rd Ed 9221 B	5400	16000	4900	Must not be detected	5000
38	Faecal Coliforms	MPN/100 ml	APHA 23rd Ed 9221 B	1700	3500	1300	--	--

Results and Discussions

In view of the above results, the existing water quality is found to be potable and fit for drinking. The same water supply sources can also be used for future up gradation of the water supply schemes. The graphical representation of the trends of important parameters like pH, Dissolved Oxygen, Biological Oxygen Demand, Total Dissolved solids, Chlorides, Sulphates as SO_4 and Nitrates as NO_3 are placed as Figures 2.8, 2.9 and 2.10.

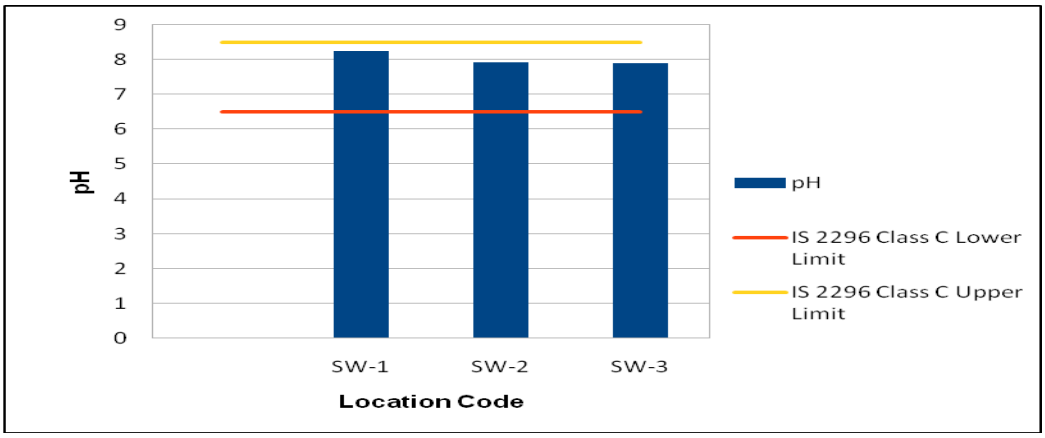
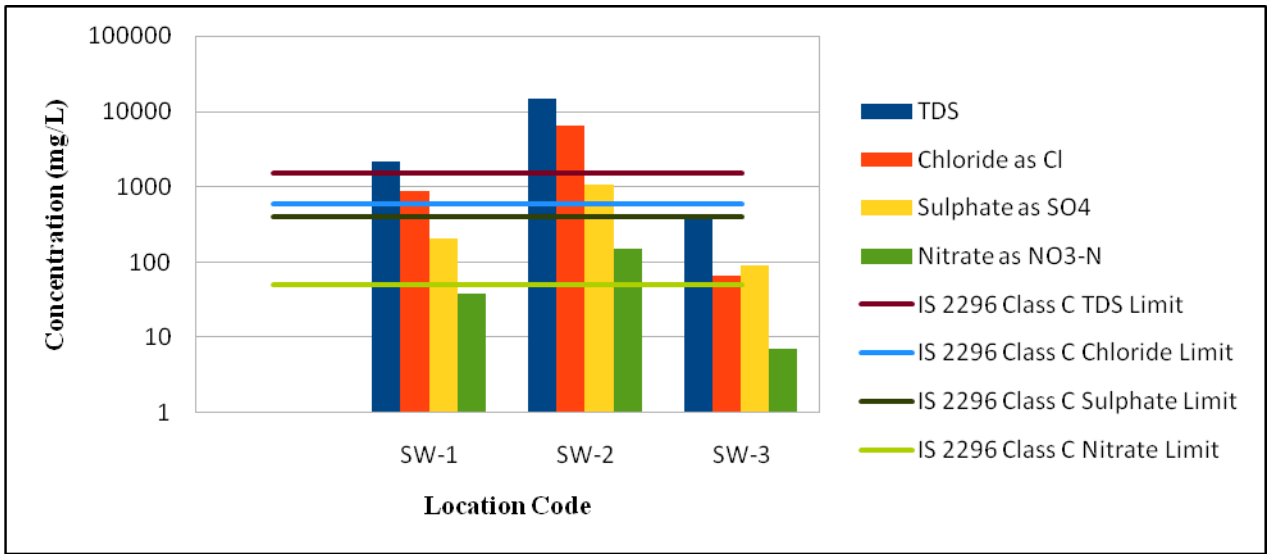


Figure 2.8 Graph showing pH values at different surface water sampling locations of Sullurpeta

Figure 2.9 Graph showing DO and BOD trends at different surface water sampling locations of Sullurpeta

Figure 2.10 Graph showing TDS, Chlorides as Cl, Sulphates and Nitrates trends at different surface water sampling locations of Sullurpeta



2.1.8 Ground Water Quality

Ground water is one of the main sources of water supply in the project corridor for domestic, commercial and other irrigation use. Hence the rate of extraction of ground water is at a considerable level. Mostly ground water is used for domestic, drinking, gardening & floor washing purposes in the region. The assessment of the ground water quality in the region is given in the following Table 2.8.

Table 2.8 Ground Water Quality Sampling Locations

Code No.	Name of the location
GW-1	Near WTP Area Mangalampadu, Sullurpetaa
GW-2	Near Harijanawada Sullurpetaa 300 KL ELSR.

The photos pertaining to the ground water sampling are placed as Figure 2.11.

Figure 2.11 Ground water sampling in Sullurpeta

The results of the water samples analysis are given in the following Table 2.9.

Table 2.9 Ground Water Quality analysis results

S.No.	Parameter	Units	Test Methods	GW-1	GW-2	IS 10500:2012 Drinking Water Specifications	
						Acceptable Limits	Permissible Limits in the Absence of Alternate Source
1	pH at 25 °C	-	IS:3025 (Part 1) 1983	7.30	7.22	6.5 – 8.5	NR
2	Color	Hazen	IS:3025 (Part 4) 1983	<01	<01	5	15
3	Odor	-	IS:3025 (Part 5) 1983	Agreeable	Agreeable	Agreeable	Agreeable
4	Conductivity at 25 °C	µS/cm	IS:3025 (Part 14)1984	1895	8308	--	--
5	Turbidity (NTU)	NTU	IS 3025 (Part 10) 1984	1.48	<1.0	1	5
6	Total Dissolve solids	mg/L	IS:3025 (Part 16) 1984	1307	5734	500	2000
7	Total Hardness as $CaCO_3$	mg/L	IS 3025 (Part 21) 2009	610	1150	200	600

S.No.	Parameter	Units	Test Methods	GW-1	GW-2	IS 10500:2012 Drinking Water Specifications	
						Acceptable Limits	Permissible Limits in the Absence of Alternate Source
8	Total Alkalinity	mg/L	IS 3025 (Part 23) 1986	400	210	200	600
9	Calcium as Ca	mg/L	IS 3025 (Part 40) 1991	64	200	75	200
10	Magnesium as Mg	mg/L	IS 3025 (Part 46) 1994	108	156	30	100
11	Chloride as Cl	mg/L	IS 3025 (Part 32) 1984	265	1950	250	1000
12	Sulphate as SO_4	mg/L	IS 3025 (Part 24) 1986	132	991.6	200	400
13	Fluorides as F^-	mg/L	IS 3025 (Part 60) 2008	0.92	1.20	1.0	1.5
14	Nitrates as NO_3	mg/L	IS 3025 (Part 34) 1988	22.4	102.4	45	NR
15	Sodium as Na	mg/L	IS 3025 (Part 45) 1993	149.5	1374	--	--
16	Potassium as K	mg/L	IS 3025 (Part 45) 1993	4.1	6.2	--	--
17	Iron as Fe	mg/L	IS 3025 (Part 53) 2014	0.18	0.36	0.3	NR
18	Zinc as Zn	mg/L	IS 3025 (Part 49) 1994	0.008	0.152	5	15
19	Chemical Oxygen Demand	mg/L	IS 3025 (Part 58) 2006	<02	<02	--	--
20	Silica as SiO_2	mg/L	IS 3025 (Part 35) 1988	10.4	36.4	--	--
21	Temperature at site	°C	IS 3025 (Part 9) 1984	25.9	26.0	--	--
22	Total Suspended Solids	mg/L	IS 3025 (Part 17) - 1984	<01	<01	--	--
23	Ammoniacal Nitrogen as N	mg/L	IS 3025 Part 34 -1988	<0.1	<0.1	--	--
24	Total Kjeldahl Nitrogen	mg/L	IS 3025 Part 34 -1988	<0.1	<0.1	--	--
25	Dissolved Oxygen	mg/L	IS 3025 (Part 38) 1989	<0.2	<0.2	--	--

S.No.	Parameter	Units	Test Methods	GW-1	GW-2	IS 10500:2012 Drinking Water Specifications	
						Acceptable Limits	Permissible Limits in the Absence of Alternate Source
26	Biochemical Oxygen Demand	mg/L	IS 3025 (Part 44) 1993	<01	<01	--	--
27	Phosphate as PO_4	mg/L	IS 3025 (Part 31) 1988	<0.02	<0.02	--	--
28	Oil & grease	mg/L	IS 3025 (Part 39) 1991	<0.1	<0.1	--	--
29	Phenolic Compounds	mg/L	IS 3025 (Part 43) 1992	<0.001	<0.001	0.001	0.002
30	Boron as B	mg/L	IS 3025:(Part-57) 2005	0.006	0.056	0.5	1.0
31	Lead as Pb	mg/L	IS 3025 (Part 47) 1994	<0.001	<0.001	0.01	NR
32	Arsenic as As	mg/L	IS 3025 (Part-37) 1988	<0.001	<0.001	0.01	0.05
33	Mercury as Hg	mg/L	IS 3025(Part-48) 1994	<0.0001	<0.0001	0.001	NR
34	Cadmium as Cd	mg/L	IS 3025 (Part 41) 1992	<0.001	<0.001	0.003	NR
35	Manganese as Mn	mg/L	APHA 23rd Ed 3111-B	<0.001	<0.001	0.1	0.3
36	Total Chromium	mg/L	IS 3025 (Part 52) 2003	<0.001	<0.001	0.05	NR
37	Copper as Cu	mg/L	IS 3025 (Part 42) 1992	0.044	0.108	0.05	1.5
38	Total Plate Count	CFU/ ml	IS: 5402:2012	Not detected	Not detected	--	--
39	Coliform	CFU/100 ml	IS 15185: 2016	Not detected	Not detected	Must not be detected	
40	Faecal Coliforms	MPN/100 ml	IS 1622: 1981	<02	<02	--	--

Results and Discussions

It is observed from the analysis of ground water quality in the study area that, the hydrogen ion concentration (pH) varies from 7.22 to 7.30, indicating the alkaline nature of ground water. Calcium together with magnesium and carbonates impart the property of hardness to water. The concentration of calcium and magnesium in ground water is within the permissible limits for domestic use. Total hardness expressed as calcium carbonate generally ranges from 610- 1150 mg/l and observed value is exceeding the permissible limit in the sample near to police station and also observed value was below acceptable limit in the sample collected near market area. The Chlorides and Sulphates are in the range of 265 - 1950 mg/l and 132 – 991.6 mg/l and the standard of 250 – 1000 mg/l and 200 – 400mg/l respectively and are observed to be above the acceptable limit.

The graphical representation of the trends of important parameters like pH, Total Dissolved Solids, Total hardness, Chlorides, Sulphates as SO_4 and Nitrates as NO_3 are placed as Figures 2.12, 2.13, 2.14 and 2.15.

Figure 2.12 Graph showing pH values at different ground water sampling locations of Sullurpeta

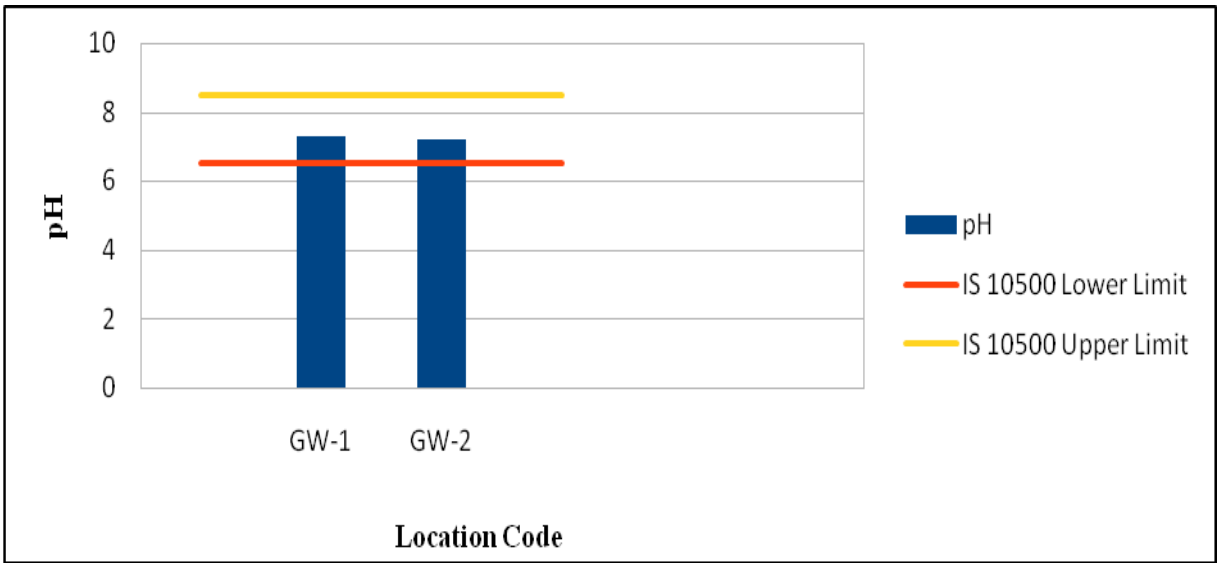


Figure 2.13 Graph showing TDS and Total hardness trends at different ground water sampling locations of Sullurpeta

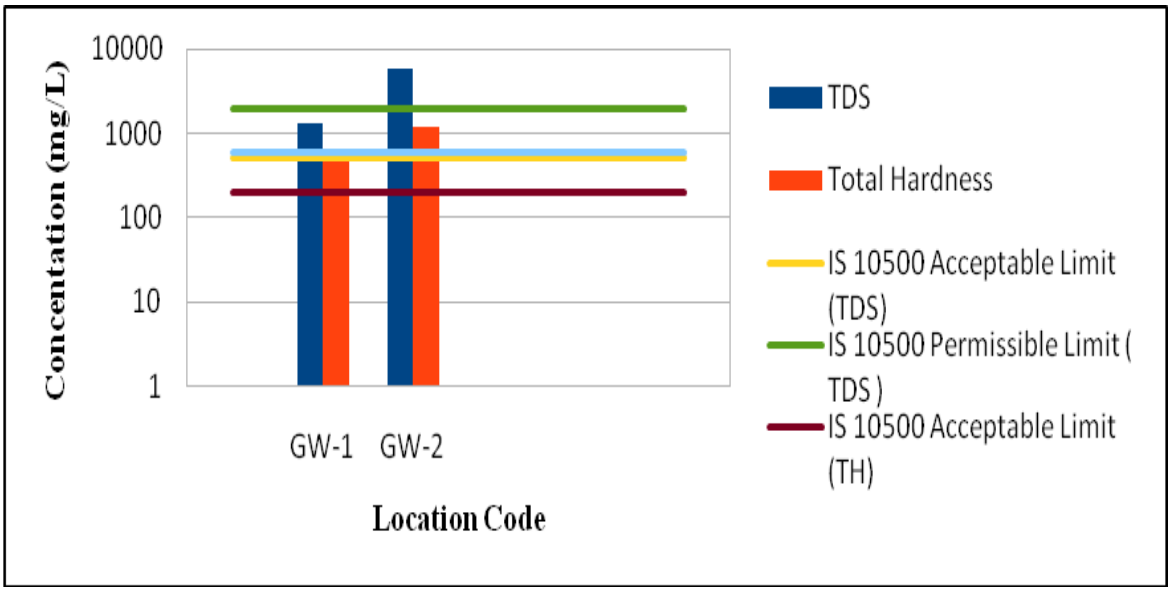


Figure 2.14 Graph showing Chlorides, Sulphate trends at different ground water sampling locations of Sullurpeta

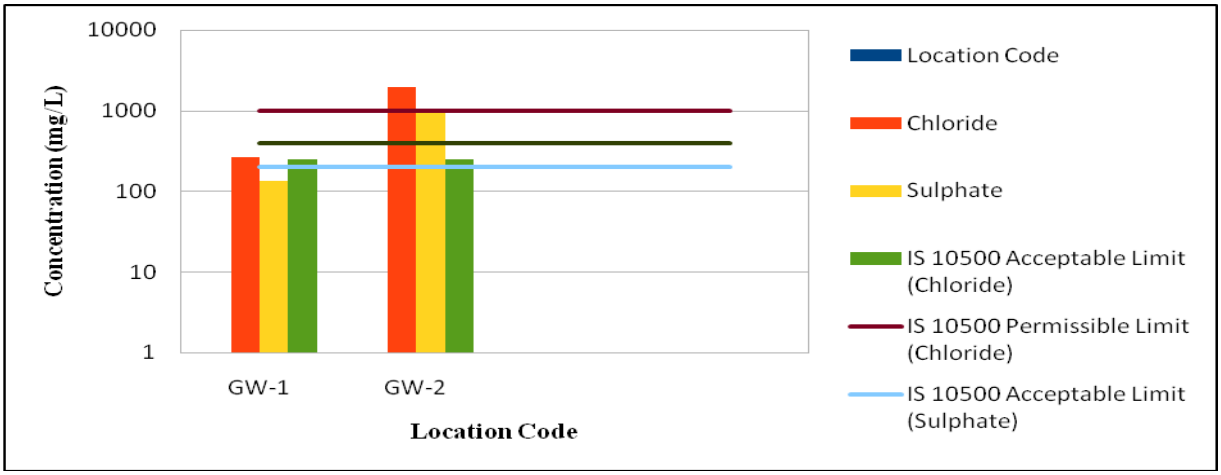
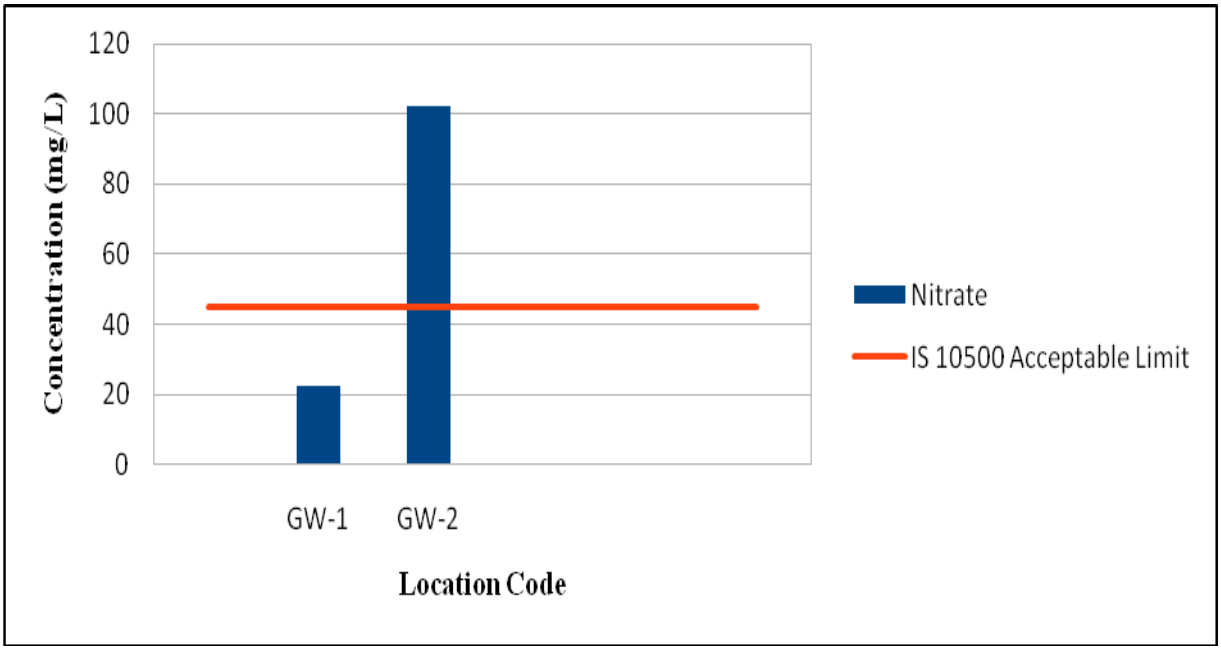


Figure 2.15 Graph showing Nitrates trends at different ground water sampling locations of Sullurpeta



2.2 Soils

For land environment, two (2) sampling locations were selected from different villages in the study area to understand the physio-chemical properties of the soil. The activities around the sampling sites are also taken into consideration to understand the sources of pollution if any. Meticulous attention was paid to collect adequate amount of composite soil samples at three depths for analysis. The samples were collected in dependable, waterproof containers and marked accurately, distinctly and brought to the laboratory for analysis. The soil sampling locations and results of the analysis are presented in the following Table 2.10.

Table 2.10 Soil Quality Sampling Locations

S.No	Location Code	Location Name
1	SQ-1	Near WTP Area Mangalampadu, Sullurpetaa
2	SQ-2	Near Harijanawada Sullurpetaa 300 KL ELSR.

The photographs of the soil sampling are placed as Figure 2.16.

Figure 2.16 Soil sampling in Sullurpeta

The soil analysis results are presented in the following Table 2.11

Table2.11 Soil Quality samples analysis results

S. No	Parameter	Units	Test Method	S-1	S-2
1	Texture			**Sandy Clay**	**Sandy Clay**
	Sand	%	FAO Method 2007	43	56
	Silt	%		14	16
	Clay	%		43	28
2	pH at 25 °C (1:5 Slurry)	-	IS 2729(Part 26):1987	8.02	7.66
3	Conductivity at 25 °C (1:5 Slurry)	µs/cm	IS 14767:2000	188	248
4	Bulk Density	g/cc	FAO Method 2007	1.74	1.46
5	Available Nitrogen	mg/kg	IS 14684: 1999	420	330
6	Available Phosphorus as PO_4	mg/kg	FAO Method 2007	80	74
7	Available Potassium as K	mg/kg	FAO Method 2007	214	188
8	Exchangeable Ca	meq/100gr	FAO Method 2007	8.12	7.2
9	Exchangeable Mg	meq/10	FAO Method 2007	1.20	1.16

S. No	Parameter	Units	Test Method	S-1	S-2
		0gr			
10	Exchangeable Na	meq/100gr	FAO Method 2007	3.60	2.40
11	Organic Carbon	%	FAO Method 2007	3.04	2.80
12	Manganese as Mn	meq/100gr	EPA 3050B – 1996	0.14	0.10
13	Zinc as Zn	meq/100gr	EPA 3050B – 1996	3.10	3.10
14	Boron as B	meq/100gr	USEPA 6010 B Dec.1996	0.18	0.14

Results and Discussions

i. The pH values are varying between 7.66 – 8.02.

ii. If soil's Electrical Conductivity (EC) is falling below 1000 micro Siemens, the soil can be classified as normal. In analyzed samples, EC is varying between 188 – 248 µS/cm.

iii. The available Nitrogen, available Phosphorous and available Potassium in the soil are varying between 330 – 420 Kg/ha, 74 – 80 Kg/ha and 188 – 214 Kg/ha respectively which are found to be sufficient for the plantation and agricultural purposes.

iv. The trace metal concentrations are found to be low.

2.3 Flora & Fauna

The land use of the study area is characterized by agricultural lands, ponds, canal system. Major part of the land area is being used for rice, sugar cane etc the land is very fertile. The built-up area is characterized by residential, commercial, hospitals, schools, village Panchayats etc.

2.3.1 Flora

Sullurpeta falls in Nellore district of Andhra Pradesh. The major crops in the study area are ice, jowar, bajra, korra, sunflower, red gram, cotton, groundnut, tobacco, chilies, fruits and vegetables. The list of important plant species present in the study area is given in the following Table 2.12.

Table 2.12 List of floral species in the study area

S.No	Scientific name	Local name	Family	As per IUCN Redlist
Trees				
1	*Acacia nilotica*	Nalla tumma	Mimosaceae	Least concern
2	*Achrus sapota*	Sapota	Sapotaceae	Not Assessed
3	*Acacia auriculiformis*	Australian Wattle	Mimosaceae	Least concern
4	*Aegle marmelos*	Maredu	Rutaceae	Not Assessed
5	*Ailanthus excels*	Pedreservoiraanu	Simaroubaceae	Not Assessed
6	*Albizia lebbek*	Dirisanam	Mimosaceae	Not assessed
7	*Allamanda cathartica*	Allamanda	Apocynaceae	Not assessed
8	*Alstonia scholaris*	Alstonia	Apocynaceae	Least concern
9	*Ancardium occidentale*	Cashew nut	Anacardiaceae	Not assessed
10	*Anogeissus latifolia*	Chiru manu	Combretaceae	Not assessed
11	*Annona squamosa*	Custard apple	Annonaceae	Not assessed
12	*Artocarpus heterophyllus*	Panasa	Moraceae	Not assessed
13	*Azadirachta indica*	Vepa	Meliaceae	Least concern
14	*Bauhinia racemosa*	Aare chettu	Caesalpiniaceae	Not assessed
15	*Bombax ceiba*	Buruga	Malvaceae	Not assessed
16	*Borassus flabellifer*	Taati / Taadi	Arecaace	Not assessed
17	*Boswellia serrata*	Guggilam	Burseraceae	Not assessed
18	*Butea monosperma*	Modugu	Fabaceae	Not assessed

S.No	Scientific name	Local name	Family	As per IUCN Redlist
19	*Carica papaya*	Papaya	Caricaceae	Data Deficient
20	*Casuarina equisetifolia*	Sarvi	Casuarinaceae	Not assessed
21	*Cocos nucifera*	Coconut	Arecaceace	Not assessed
22	*Dalbergia sissoo*	Sisso or Seesum	Caesalpiniaceae	Not assessed
23	*Diospyros melanoxylon*	Tunki	Fabaceae	Not assessed
24	*Ficus benghalensis*	Marri	Moraceae	Not assessed
25	*Ficus racemosa*	Medi	Moraceae	Not assessed
26	*Ficus religiosa*	Raavi	Moraceae	Not assessed
27	*Hardwickia binata*	Yepi	Caesalpiniaceae	Not assessed
28	*Emblica officinalis*	Usiri	Euphorbiaceae	Not assessed
29	*Lagerstroemia parviflora*	Chennangi	Lythraceae	Not assessed
30	*Leucaena leucocephala*	Subabul	Mimosaceae	Not assessed
31	*Citrus limonum*	Lime	Rutaceae	Not assessed
32	*Mangifera indica*	Mamidi	Anacardiaceae	Data Deficient
33	*Mimusops elengi*	Pogada	Sapotaceae	Not assessed
34	*Morinda pubescens*	Togaru	Rubiaceae	Not assessed
35	*Moringa oleifera*	Munaga	Moringaceae	Not assessed
36	*Muntingia calabura*	Wild cherry	Elaeocarpaceae	Not assessed
37	*Peltophorum pterocarpum*	Konda chinta	Caesalpiniaceae	Not assessed
38	*Phoenix sylvestris*	Eetha	Arecaceae	Not assessed

S.No	Scientific name	Local name	Family	As per IUCN Redlist
39	*Phyllanthus emblica*	Usiri	Euphorbiaceae	Not assessed
40	*Pithecellobium dulce*	Seema chinta	Mimosaceae	Not assessed
41	*Polyalthia longifolia*	Ashoka	Annonaceae	Not assessed
42	*Pongamia pinnata*	Ganuga	Fabaceae	Least concern
43	*Prosopis juliflora*	English tumma	Mimosaceae	Not assessed
44	*Prosopis cineraria*	Jammi	Fabaceae	Not assessed
45	*Sapindus emarginatus*	Kunkundu	Sapindaceae	Not assessed
46	*Syzygium cumini*	Neradu	Myrtaceae	Not assessed
47	*Tamarindus indica*	Chinta	Caesalpiniaceae	Least concern
48	*Tectona grandis*	Teak / Teku	Verbenaceae	Not assessed
49	*Terminalia arjuna*	Tella maddi	Combretaceae	Not assessed
50	*Terminalia catappa*	Baareservoir	Combretaceae	Not assessed
51	*Thespesia populnea*	Ganga Raavi	Malvaceae	Least concern
52	*Zizyphus jujuba*	Regu	Rhamnaceae	Not assessed
53	*Ziziphus nummularia*	Nela Regu	Rhamnaceae	Not assessed
Climbers				
54	*Bougainvillea*	Paper flower	Nyctaginacear	Not assessed
55	*Cissus quadrangularis*	Nalleru	Vitaceae	Not assessed
56	*Clitoria ternatea*	Sankupushpam	Fabaceae	Not assessed
57	*Diospyros chloroxylon*	Ulinda	Ebenaceae	Not assessed

S.No	Scientific name	Local name	Family	As per IUCN Redlist
58	*Quisqualis indica*	Rangoon creeper	Combretaceae	Not assessed
Shrubs				
59	*Alangium salvifolium*	Ooduga	Alangiaceae	Not assessed
60	*Calotropis gigantean*	Tella Jilledu	Asclepiadaceae	Not assessed
61	*Calotropis procera*	Jilledu	Asclepiadaceae	Not assessed
62	*Cassia auriculata*	Tangedu	Caesalpiniaceae	Not assessed
63	*Cassia fistula*	Rela	Caesalpiniaceae	Not assessed
64	Cascabela thevetia	Patcha ganneru	Apocynaceae	Not assessed
65	*Nerium indicum*	Ganneru	Apocyanaceae	Not assessed
Herbs				
66	*Achyranthus aspera*	Uttareni	Amaranthaceae	Not assessed
67	*Datura stramonium*	Ummetta	Solanaceae	Not assessed
68	*Carissa spinarum*	Kalivi / Vaaka	Apocynaceae	Not assessed
69	*Tephrosia purpurea*	Vempali	Fabaceae	Not assessed
70	*Hemidemus indicus*	Sugandhapala	Periplocaceae	Not assessed
71	*Jatropha glandulifera*	Wild Castor	Euphorbiaceae	Not assessed
72	*Lantana camara*	Makkareservoirbu	Verbenaceae	Not assessed
73	*Ocimum sanctum*	Tulasi	Lamiaceae	Not assessed
74	*Parthenium hysterophorus*	Congress grass	Asteraceae	Not assessed
75	*Tridax procumbens*	Tatapilakaaku	Asteraceae	Not assessed

S.No	Scientific name	Local name	Family		As per IUCN Redlist
76	*Croton bonplandianum*	Gaalivaana mokka	Euphorbiaceae		Not assessed
Cactus					
77	*Opuntia dillenii*	Naaga Jemudu	Cactaceae		Not assessed
78	*Opuntia vulgaris*	Nagajemudu	Cactaceae		Not assessed
Grasses					
79	*Aristida setacea*	Paraka gaddi	Poaceae		Not assessed
80	*Eragrostis tenella*	Garika gaddi	Poaceae		Not assessed
81	*Cynodon dactylon*	Lawn grass	Poaceae		Not assessed
82	*Cymbopogon caesius*	Grass	Poaceae		Not assessed
83	*Aristida adscensionis*	Grass	Poaceae		Not assessed
84	*Bambusa arundanacea*	Veduru	Cyperaceae		Not assessed

Figure 2.17 Photographs showing the sites where the trees might get affected

2.3.2 Fauna

Based on the secondary survey the faunal species found in the study area is tabulated at Table 2.13. From the study, it has been observed that there are no endangered, endemic or threatened species in the study area.

Table 2.13 List of Faunal species in the study area

S.NO	Scientific name	Common name	Family	As per IUCN status
MAMMALS				
1	*Cynopterus sphinx*	Short-nosed fruit bat	Pteropodidae	Least Concern
2	*Funambulus palmarum*	Three striped squirrel	Sciuridae	Least Concern
3	*Axis axis*	Spotted deer	Cervidae	Least concern
4	*Lepus nigricollis*	Hare	Leporidae	Least concern
5	*Canis lupus pallipes*	Wolf	Canidae	Not assessed
6	*Bubalus bubalis*	Buffalo	Bovidae	Not assessed
7	*Hyaena hyaena*	Hyenas	Hyaenidae	Near threatened
8	*Herpestes edwardsii*	Indian grey mongoose	Mungeesa	Least concern
9	*Vulpes benghalensis*	Fox	Canidae	Least concern
10	*Macaca mulatta*	Rhesus Macaque	Cercopithacidae	Least concern
11	*Mus musculus*	Home mouse	Muridae	Least concern
12	*Sus scrofa*	Wild boar	Adavi Pandi	Least concern
13	*Capra hircus aegagrus*	Goat	Bovidae	Not assessed
14	*Melursus ursinus*	Bear	Ursidae	Vulnerable
15	*Canis lupus familiaris*	Dog	Canidae	Not assessed
16	*Bos taurus indicus*	Cow	Bovidae	Not assessed
BIRDS				
17	*Accipiter badius*	Shikra	Accipitridae	Least concern
18	*Acridotheres tristis*	Common myna	Sturnidae	Least concern
19	*Aegithinia tiphia*	Common Iora	Irenidae	Least concern
20	*Ardeola grayii*	Pond heron	Ardeidae	Least concern

S.NO	Scientific name	Common name	Family	As per IUCN status
21	*Alcedo atthis*	Smallblue kingfisher	Alcedinidae	Least concern
22	*Athene brama*	Spotted owlet	Noctuidae	Least concern
23	*Bubulcus ibis*	Cattle Egret	Ardeidae	Least concern
24	*Centropus sinasis*	Greater coucal	Phasianidae	Least concern
25	*Ceryle rudis*	Lesser pied Kingfisher	Alcedinidae	Least concern
26	*Columba livia*	Blue rock pigeon	Columbidae	Least concern
27	*Coracias benghalensis*	Indian roller	Coraciidae	Least concern
28	*Corvus splendens*	House crow	Corvidae	Least concern
29	*Dendrocitta vagabunda*	Indian tree pie	Corvidae	Least concern
30	*Dendrocygna javanica*	Lesser whistling-duck	Anatidae	Least concern
31	*Dicaeum erythrorhynchos*	Tickell's flower pecker	Dicaeidae	Least concern
32	*Anas poecilorhyncha*	Duck	Anatidae	Least concern
33	*Dicrurus macrocercus*	Black drongo	Dicruridae	Least concern
34	*Egretta garzetta*	Little egret	Ardeidae	Least concern
35	*Elanus caeruleus*	Black-shouldered kite	Accipitridae	Least concern
36	*Eudynamys scolopaceus*	Asian koel	Cuculidae	Least concern
37	*Halcyon smyrnensis*	White-Breasted King fisher	Alcedinidae	Least concern
38	*Hierococcyx varius*	Brain fever bird	Ardeidae	Least concern
39	*Himantopus himantopus*	Black-winged stilt	Recurvirostridae	Least concern
40	*Hydrophasianus chrugus*	Pheasant tailed Jacana	Jacanidae	Least concern
41	*Lanius excubitor*	Great grey shrike	Daniidae	Least concern
42	*Megalaima haemacephala*	Copper smith Barbet	Capitonidae	Least concern
43	*Merops orientalis*	Small Bee eater	Meropidae	Least concern
44	*Milvus migrans*	Black kite	Accipitridae	Least concern
45	*Motacilla alba*	White wagtail	Motacillidae	Least concern

S.NO	Scientific name	Common name	Family	As per IUCN status
46	*Motacilla flava*	Yellow wagtail	Motacillidae	Least concern
47	*Motacilla maderaspatensis*	Large pied wagtail	Motacillidae	Least concern
48	*Nectarinia asiatica*	Purple sunbird	Nectariniidae	Least concern
49	*Nectarinia zeylonica*	Purple-rumped sunbird	Nectariniidae	Least concern
50	*Passer domesticus*	House sparrow	Passeridae	Least concern
51	*Pericrocotus cinnomomeus*	Small Minivet	Phasianidae	Least concern
52	*Phalacrocorax carbo*	Large Cormorant	Phalacrocoracidae	Least concern
53	*Phalacrocorax niger*	Little cormorant	Phalacrocoracidae	Least concern
54	*Gallinula chloropus*	Moorhen	Rallidae	Least concern
55	*Prinia inornata*	Plain prinia	Cisticolidae	Least concern
56	*Prinia socialis*	Ashy prinia	Cisticolidae	Least concern
57	*Psittacula cyanocephala*	Blossom headed Parakeet	Psittacidae	Least concern
58	*Psittacula krameri*	Rose-Ringed Parakeet	Psittacidae	Least concern
59	*Pycnonotus cafer*	Red-vented bulbul	Pycnonotidae	Least concern
60	*Copsychus fulicatus*	Indian robin	Turdinae	Least concern
61	*Streptopelia chinensis*	Spotted dove	Columbidae	Least concern
62	*Streptopelia decaocto*	Eurasian Collared-Dove	Columbidae	Least concern
63	*Streptopelia Senegalensis*	Little brown dove	Columbidae	Least concern
64	*Streptopelia tranquebarica*	Red Collared-Dove	Columbidae	Least concern
65	*Sturnus pagodarum*	Brahminy starling	Sturnidae	Least concern
66	*Turdoides caudatus*	Common babbler	Timalinae	Least concern
67	*Upupa epops*	Common hoopoe	Upupidae	Least concern
68	*Vanellus indicus*	Red-wattled lapwing	Charadriidae	Least concern
REPTILES				
69	*Bungarus*	Common Indian	Katla paamu	Not assessed

S.NO	Scientific name	Common name	Family	As per IUCN status
	caeruleus	Krait		
70	*Calotes versicolor*	Garden lizard	Thonda	Not assessed
71	*Ahaetulla nasuta*	Vine snake	Colubridae	Not assessed
72	*Echis carinatus*	Saw scaled viper	Viperidae	Not assessed
73	*Geochelone elegans*	Indian star tortoise	Testudinidae	Vulnerable
74	*Hemidactylus flaviviridis*	Indian wall lizard	Gekkonidae	Not assessed
75	*Naja naja*	Cobra	Elapidae	Not assessed
76	*Ptyas mucosa*	Rat snake	Colubridae	Not assessed
77	*Varanus bengalensis*	Common Indian Monitor	Varanidae	Not assessed
AMPHIBIANS				
78	*Bufo melonosticatus*	Common Indian Toad	Bufonidae	Least concern
79	*Hoplobatrachus tigerinus*	Tiger Frog	Dicroglassidae	Least concern
80	*Rana hexadactyla*	Green Pond Frog	Dicroglassidae	Least concern
81	*Sphaerotheca breviceps*	Indian Burrowing frog	Burada kappa	Least concern
FISHES				
82	*Channa marulius*	Korrameenu	Channidae	Least concern
83	Labeo catla	Boche cheap	Cyprinidae	Least concern
84	Labeo rohita	Rohu	Cyprinidae	Least concern

However, the following faunal species are found near to the project site as shown in Table 2.14

Table 2.14 Fauna near project site

S.No	Scientific Name of the animal	Common name	Family	Classification as per IUCN Redbook
1	*Bubalus bubalis*	Buffalo	Bovidae	Not assessed
2	*Bos taurus indicus*	Cow	Bovidae	Not assessed
3	*Capra hircus aegagrus*	Goat	Bovidae	Not assessed
4	*Ovis guineensis*	Sheep	Bovidae	Not assessed
5	*Canis lupus familiaris*	Dog	Canidae	Not assessed
6	*Sus scrofa domesticus*	Pig	Suidae	Not assessed

CHAPTER – 3

PROJECT DESCRIPTION AND ANALYSIS OF ALTERNATIVES

3.1 Existing and Proposed Water Supply System In Project Area

The existing water supply system for Sullurpeta Municipality fulfills demand only for 40 to 50 lpcd.There is no regular piped Water Supply system to the entire Town including habitation of the Municipal Area. The supplies are being given to the certain areas with piped Water Supply System with Bore Wells. At present there is an existing SS tank of Capacity 700ML which is not sufficient to the present requirement. This SS tank is constructed near Peddannagari Village. The source for this existing SS tank is from Telugu ganga branch canal. And also, the water is supplied to the filters and to the town. There were 4 nos of Slow sand filters near the SS tank. The water from the SS tank is supplied to the Existing ELSRs in the town by Piped Network. The piped network and existing ELSRs are not properly functioning and not sufficient for future requirement.

There are 10 nos small storage reservoirs ranging from 40 KL to 250 KL which are fed by Bore Wells and from SS tank by pumping. This existing infrastructure is insufficient even for the present demand in Sullurpeta Town. There are about 10 OHSR ranging 20 KL to 250 KL capacity in main town of Sullurpeta. The supplies from these are insufficient and the distribution network is not covered in the entire area of the Town. The existing Distribution System is very old.

It is necessitated at present to have a regular Comprehensive Water Supply Scheme along with the Distribution Network for the entire Town, drawing water from the source, i.e. from Telugu Ganga Canal.

Description of the Sub-Project Components

Comprehensive planning of Sullurpeta town Urban water supply scheme is a medium water supply scheme, which is proposed for implementation in the Base year 2018, designed Intermediate year is 2033 and ultimate year is 2048. The concept plan has been developed based on the outcome of feasibility analysis and decision taken in the meeting held with PH Engineering Dept and commissioner, Sullurpeta Municipality. The total Project cost is worked out based on the Common

SoR Rates for the year 2018-19. The total cost of the project including O&M cost of the seven years excluding power charges has been estimated at 142.10 Crore.

The proposed Sullurpeta Water Supply Improvement Scheme consists of the following main components.

i. Water Supply Source for the project is Telugu Ganga Canal.
ii. 5m dia intake well cum pump house.
iii. 900mm dia & 600 mm dia DI K9 of lengths 3200m and 8900m Raw water Gravity main (Intake to WTP).
iv. Summer Storage Tank of 2000 ML capacity
v. Raw Water Sump near SS Tank of 300 KL capacity
vi. 400mm dia DI K9 Raw Water Pumping Main from Prop. Raw water sump to WTP
vii. 11.00 mld Water Treatment Plant.
viii. 600 KL Clear Water Sump at WTP site.
ix. Clear water pumping mains to all Service Reservoirs.
x. Elevated Level Service Reservoirs (ELSR).
xi. Distribution System
xii. Household Connection with Metering
xiii. O&M for seven years

3.2 Potential Impacts and Risks form the Proposed Water Supply Components

The list of Potential Impacts and Risks form the Proposed Water Supply Components given in the following Table 3.1

Table 3.1 Impacts/ Risks from proposed water supply components

S.No	Sources	Potential Impacts/Risks	Mitigation Measures
1	Intake well	Air and Noise pollution expected during construction and during operations phases , Aquatic disturbances, Solid waste issues especially during Construction period	i. Excavation of Intake well dust will be generated. Water will be sprinkling. ii. The major noise generating sources are water pumps and diesel generators which will be located at intake points. These intake points are far away from the habitations. iii. The excavated soil during the construction period. The excavated soil is used for construction of road, bunds, low lying area. iv. Phytoplanktons and zooplankton species will be taken care. v. The top soil will be preserved
2	DI Pipes	Air and Noise pollution, Plants removal and utilities shifting along alignment, Solid waste issues during construction period	**During Construction Period:** i. Laying of Pipe line dust arise from excavation, raw material storing. Mitigation measure is sprinkling of water arrangement ii. Noise will be generating during construction period earth moving machines, Trucks etc. iii. Excavated soil will be disposed or backfilling the trenches.
3	Water treatment Plant	Air and Noise pollution, Solid waste issues during construction period Effluents and sludge during operation period During construction Period Solid waste and Sludge disposal and Effluent Generation of Sludge and	**During the construction period :** i. Excavation of water treatment dust will be generated and raw material handling. Mitigation Measures is water will be sprinkling. ii. Expected noise generating sources during construction periods are heavy machineries, trucks, dewatering pumps etc... However these activities will be executed during day timings and confined to little periods only.

S.No	Sources	Potential Impacts/Risks	Mitigation Measures
		effluents Storage of Chemicals such as coagulants, chlorine gas/liquid etc.	iii. The excavated soil during the construction period. iv. Mitigation Measure: The excavated soil is used for construction of road, bunds, low lying area. **During Operation Period:** i. The WTP effluents shall be characterized for particle composition along with the other chemical parameters. The sludge disposal mechanism will be chosen either by dry disposal or wet disposal depends upon the percentage of particle in the Effluents. The effluents shall also be characterized to understand about the nature of the effluents and for identification of appropriate technologies such as manure preparation, dry cakes for usage as fuels. ii. Chlorine and bleaching powder are toxic to humans. Ingestions, inhalations, application to body parts, especially to such parts as eyes, nose and mouth is extremely hazardous. iii. The storage, in-plant handling and dosages of chlorine (bleaching powder) must be addressed and procedures set up and guidelines developed for its handling and first aid measures to be introduced for emergencies and the training and operational supervision of system staff.
4	Structures	Construction of Elevated Level Service Reservoirs (ELSR) and other structures Proper storage and handling of raw materials Labor management	i. Raw material storing: Dust will be generating. ii. Mitigation Measure: Water sprinkling the raw materials and proper storage and stacking of raw materials. iii. A separate labor camps shall be set up and organized by contractors near to the

S.No	Sources	Potential Impacts/Risks	Mitigation Measures
		Risks due to working at Higher elevations Issues related Debris disposal , Tree cuttings, Top soil preservation etc.	project sites. The planned camps shall be maintained as per the approved EHS guidelines and periodic instructions given by supervisory staff. iv. Working at high elevations belt will be provided and necessary precaution will be taken care. v. Tree removal Possibility for Elevated Level Service Reservoirs (ELSR) and other structures of trees and tree composition 1:5 ratio. vi. The excavated top soil will be preserved. vii. The excavated Soil will be used as backfilling, disposed to low lying area.
5	Pumping mains Distribution systems	Air, Noise, Solid waste pollution during construction periods. Damages caused to the Household stair cases/Ramps/ utilities etc.	viii. Pumping mains: Noise will be generated these are away from localities. ix. Construction related activity such as digging of trenches for lying of pipes can affect the local land system causing silt runoff. Ponding of street surfaces could create problems. x. The mitigation measures are of more precautionary type such as proper and timely back filling of the excavated trenches; reuse of the excavated earth and proper disposal of the surplus excavated soil. The excavated trench will be refilled immediately after laying of pipes and brought back to normal conditions. xi. The expected noise generating sources during construction periods are breakers, batch mix plants, heavy machineries, trucks, dewatering pumps etc... However these activities will be executed during day timings and confined to little periods only.

S.No	Sources	Potential Impacts/Risks	Mitigation Measures
			xii. Tree removal Possibility for alignments of trees and tree composition 1:5 ratio. xiii. Broken stair/shop will provided access to their home. Where work is progress by providing pathways and if any losses been considered will pay compensation to shop vendors. Utility damages will be repaired by the contractor
6	House hold metering	Leakages Possibility for drainage contamination	i. Checking the leakages daily and repairing ii. Avoid the drainage contaminations
7	-	Environmental Health and Safety Guidelines during Construction/Operation/ Maintenance	Approved EHS guidelines shall be adopted during implementation of the Project.

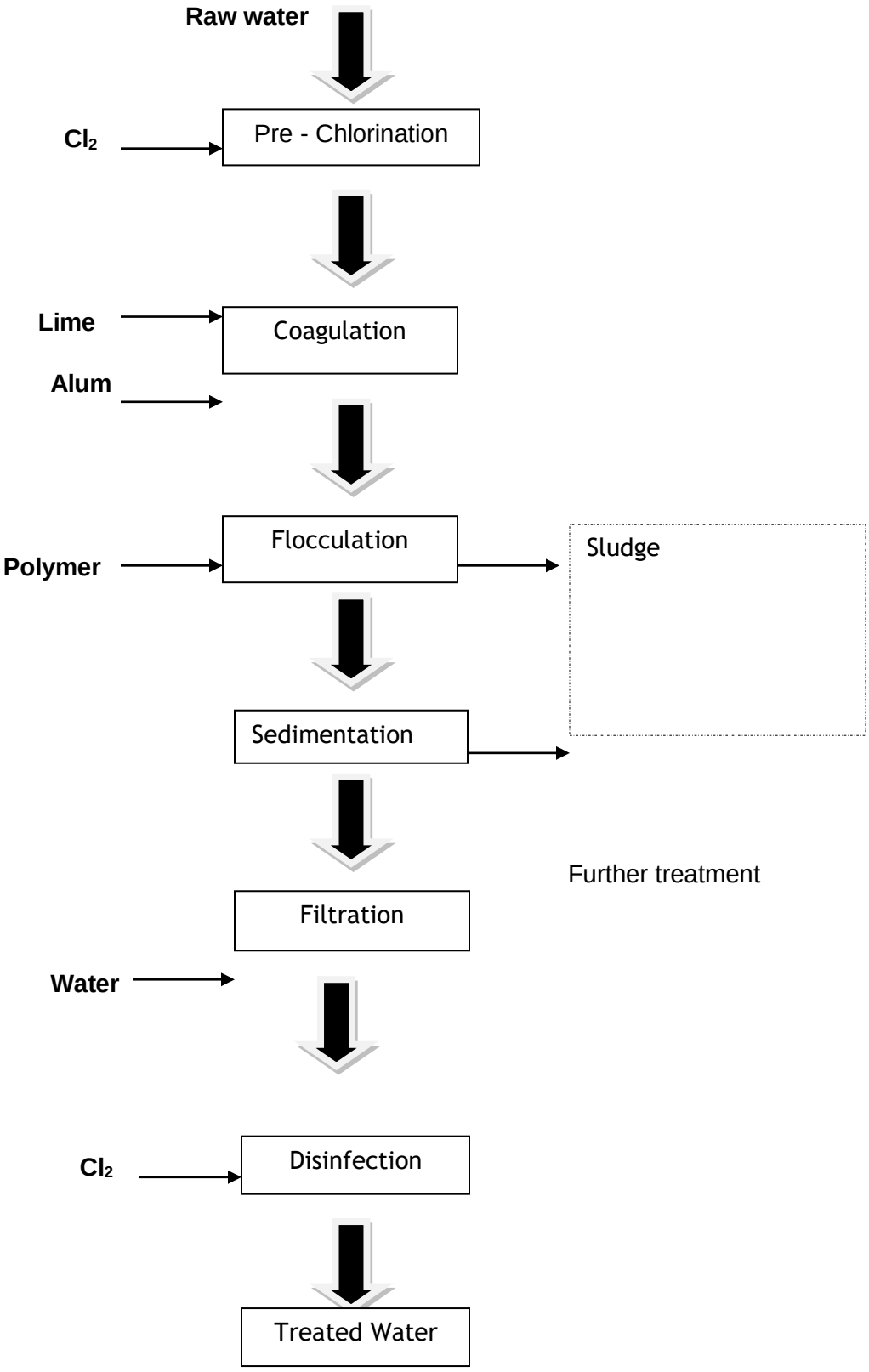
3.3 Proposed Water Supply System in Sullurpeta

Detailed Investigations are conducted, it is identified to draw water from Telugu Ganga Canal. Drawing water from Canal which is at a distance of 20.0 Km from the town. It is proposed to have a Collecting Well at Telugu Ganga Canal to draw water and transmit the water to the Proposed SS tank /WTP and after the treatment the same has to be distributed with distribution Network. The ultimate requirement of Raw Water for the year 2048 i.e. 15.00 MLD.

Water Treatment Plant:

The objective of the treatment of water is to produce water which shall be free from pathogenic micro organisms and other toxic components and shall be clear and fresh meaning no smell, no taste, no color and have cool temperature. The treatment process shall be suitable to treat large volume of water and ensure safe and easy operation of the WTP. Typical steps in a conventional water treatment process are given below. The type of treatment to be provided will depend on the raw water characteristics. Conventional Water Treatment Steps in a drinking WTP is shown below Figure no. 3.1.

Figure 3.1 Flow chart showing the Water treatment Process



Water Demand

Considering the Sewerage is not contemplated in near future, the demand is estimated as per the CPHEEO Manual. The same is placed in Table 3.2.

The Per capita demand: 135 LPCD

UFW losses: 15%

Transmission losses: 5%

Firefighting: As per the norms & population

Commercial & Industrial demand is considered as the Commercial & Educational Institutions are existing in the town. 5% of demand is taken for Industrial and Commercial.

135 LPCD + 15% UFW Losses (Clear Water Demand)

Table 3.2 Year wise clear water demand estimate

Sl. No.	Component	Base year 2018	Prospective year 2033	Ultimate year 2048
1	Population	49,814	56,817	71,384
2	Per capita demand (lpcd)	135	135	135
3	Demand (MLD)	6.73	7.67	9.64
4	Floating Population (@5%)	2491	2841	3569
5	Per capita demand for visitors (lpcd)	70	70	70
6	Demand for floating population (MLD)	0.17	0.20	0.250
7	Total Population	52,305	59,658	74,953
8	Fire Fighting demand (MLD)	0.706	0.754	0.845
9	Industrial Demand (MLD)	0.34	0.38	0.48
10	Total Demand	7.941	9.01	11.21
11	UFW losses (@15%)	1.49	1.69	2.08
12	**Total Clear Water Demand**	**9.44**	**10.69**	**13.30**

Raw Water Demand

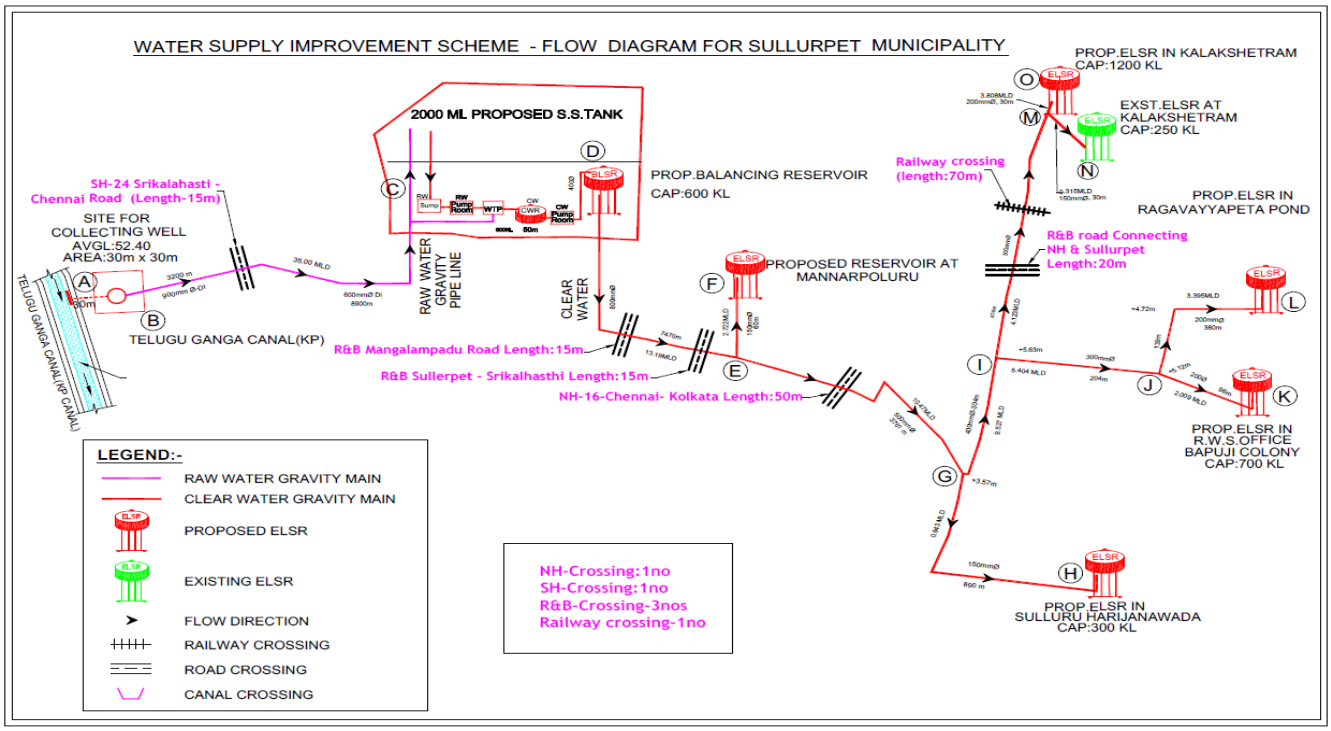
Year wise raw water demand is shown in Table 3.3.

Table 3.3 Year wise Raw water demand

Description	Year	Population	Total Clear Water Demand	Filtration Losses @ 10%	Total Raw Water Demand in MLD
Sullurpeta Town	2018	52305	**9.44**	0.94	10.38
				Total	**10.50**
Sullurpeta Town	2033	59658	**10.69**	1.07	11.76
				Total	**12.00**
Sullurpeta Town	2048	74953	**13.30**	1.33	14.63
				Total	**15.00**

3.4 Description of the Sub-Project Components

Figure 3.2 Diagram showing the components of water supply scheme at Sullurpeta



Source:

The Telugu Ganga Canal is situated 20 Km away from the town.

The salient features of the Telugu Ganga Canal are as follows:

GL	: + 52.40 M
Canal Bed Level	: + 46.60 M
Bund Level	: + 52.00 M
MWL	: + 50.73 M

Collection Well at Telugu Ganga Canal

A Colleting well is proposed near Canal at starting point of the Canal. The total Raw water requirement for the ultimate year 2048 i.e; 15.0MLD to be drawn from this Collecting well which is 5.0 m dia.

Raw Water Gravity Main from Collecting well to proposed WTP

The Raw water transmission main is proposed by gravity to a length of 12.10 KM. The Raw water demand for 2048 is 15.0 MLD. The Raw water Gravity main is designed for the Maximum drawl of SS tank 35.00 MLD. As per the topography there is a Ridge Point is at 3.20KM. Upto this Ridge Point the Raw Water Gravity main is proposed with 900mm dia and from there 600mm dia DI pipe is proposed upto SS Tank / WTP with a length of 8.90 Km.

SS Tank

The SS Tank is proposed with a Capacity for 90 days is 2000ML near Mangalampadu village. And the area required for this SS Tank is 120 Acres. The land required for this SS tank belongs to Govt. Land.

Water Treatment Plant

It is proposed to have a WTP of capacity 11.00 MLD for the prospective demand of 2033 at the SS tank premises. The Clear water reservoir is also proposed near WTP 600KL capacity for the storage of clear and further pumping to the Balancing Reservoir. Clear water pumping station with equipment is also proposed near the WTP to pump water from the Clear water reservoir to the proposed Balancing Reservoir near WTP only. The WTP and Balancing Reservoir are proposed at Mangalampadu Village in the premises of SS tank only.

Chemicals use and Storage at Water works

There are numerous chemicals used at water treatment plants in the production of drinking water. Hence, it is become imperative to be familiar with the chemicals used at their facilities, specific chemical selection and applications, and safe storage and handling. All chemicals are potentially dangerous and necessary precautions must be taken before handling any chemical.

Table 3.4 Chemical Requirement for Proposed Project

Sl.No	Chemical Dosage (mg/liter)	For 1 MLD of water (kg)
1	Chlorine 3 mg/liter	3kg
2	Alum 50 mg/liter	50 kg
Total Requirement for Chemicals Chorine and Alum		
1	Chlorine requirement for 3 months	90 days *3kg=270 kgs (1MLD) 11MLD =11*270kg=2970 kgs
2	Alum requirement for 3 months	90 days*50kg=4500 kgs(1MLD) 11MLD= 11*4500kg =49500 kgs

Source: Detailed Project Report

Material Safety Data Sheets (MSDS)

A Material Safety Data Sheet (MSDS) is the best source of information regarding a chemical. The MSDS is required to be made available to employees and operators whenever there is the likelihood of the hazardous substance or mixture being introduced into the workplace. No chemical should be received, stored or handled without essential safety information being provided to those who come into contact with the substance.

The MSDS will provide at least the following information:

i. Identification of composition, formula, and common and scientific names;
ii. Specific gravity, boiling/freezing points, solubility and vapour pressure;
iii. Incompatible substances and decomposition products;
iv. Health hazards;

v. Environmental Impacts;
vi. Personal Protective measures and engineering/administrative controls; and
vii. Safe handling, storage, disposal and cleanup procedures.
viii. Chemical Storage at Waterworks: Water treatment chemicals can be stored in a number of ways including:
ix. Solid (dry) form (bags, cartons, drums);
x. Liquid form (drums, tanks, cylinders); and
xi. Gaseous form (cylinders).

When unloading or transferring chemicals, one has to be especially careful. Moreover, one needs to be familiar with the locations and use of all safety showers and eye wash fountains and test them periodically to be sure they function properly. Wear protective clothing when working with chemicals. Goggles and face shields will protect your eyes and face. Protect other exposed portions of the body by wearing rubber or neoprene gloves, aprons or other protective clothing. Chemical dust can irritate the eyes and respiratory system. Use respirators when appropriate and always use dust collectors if available. Promptly wash down or clean up all chemical spills to prevent falls and/or physical contact with the chemical.

Chemicals should be stored in accordance with the manufacturer's written recommendations and in accordance with the requirements of Hazardous and Other Wastes (Management and Trans boundary Movement) Amendment, Rules, 2019.

The general requirements for storage of hazardous substances in containers that are required for the water treatment plant are as follows:

i. Containers must be situated in an area which is constructed and maintained to prevent any release from entering a water supply, sanitary sewer or storm sewer or from contaminating any other area.
ii. Containers must be stored within a building or area outside of a building which is fenced and posted to restrict access and warn of the materials stored within.
iii. Containers must be clearly marked or labeled.
iv. Containers must be kept in segregated storage which, in the event of a spill or release, will prevent chemical reactions or fires. Chemicals must also be stored apart from food items.

v. Certain records and documents must also be kept including MSDSs, an inventory of chemicals (hazardous substances) in storage, records of spills, leaks or unaccountable inventory discrepancies, inspection and maintenance records for leak detection and containment systems at the facility and an emergency response plan in relation to chemicals stored on site.

vi. Additionally, at least semi-annually, a current copy of the chemical storage inventory must be provided to the local fire department. A copy of the facility chemical storage emergency response plan must be provided to the local fire department either annually or whenever the plan is revised.

Chlorine Gas Storage:

Chlorine is one of the most common chemicals used in the water treatment plant. Chlorine is a strong respiratory irritant, and either prolonged exposure to chlorine gas or high concentrations of chlorine gas could be fatal. Wherever chlorine gas is stored or used, the following safety equipment should be provided:

i. Shower and eye wash facility;
ii. Emergency breathing apparatus;
iii. Chlorine gas detector;
iv. Floor level vents; and
v. Fans that maintain a positive air pressure in the storage facility.

The safety equipment mentioned is not a regulatory requirement, but is an important safety consideration. These safety related items are in line with the Occupational Health and Safety Regulations. All water treatment plant operators should be fully trained in chlorine safety and leak detection procedures.

Pumping Main from WTP to the Proposed Balancing Reservoir

It is proposed to pump the water from Clear Water Reservoir at WTP to the Proposed Balancing Reservoir to facilitate the distribution to the zonal reservoirs by gravity. The pumping main is designed for the ultimate demand i.e. 13.30 MLD, taking into consideration 23hours of pumping. As per the CPHEEO manual the pumping hours are to be considered for design purpose as 23 hrs. The diameter of the pumping main is 400mm to a length of 50m. The DI K9 pipes are proposed for the

pumping main. The pipe material DI is proposed taking into considerations the life of pipe, durability, sustainable for the working pressure and also ease in maintenance. The MS pipe will withstand for the pumping pressures, but the cost of the pipe will be higher than the DI pipe. Therefore, DI K9 pipes are adopted for the design of pumping main.

Clear Water Pumps & Pumping Equipment

The Clear Water Pumps are designed for the demand of 2033 to pump water from WTP to Balancing Reservoir at Mangalampadu Village with Pump Room. The pumps and pumping equipment are accordingly provided in the project.

Balancing Reservoir near WTP

A circular RCC Balancing Reservoir of 600 KL capacity is proposed to have one-hour storage. The Reservoir is proposed with a staging of 20m. The proposed reservoir with this staging facilitates to transmit water to zonal reservoirs by gravity. The chlorination arrangements are proposed near the Reservoir for disinfection.

Zonal Service Reservoirs

The total town area is divided into 3 zones in Sullurpeta Town as per the topography and the convenience of the equal distribution of water. Based on the zonal requirement and the existing reservoirs further reservoirs are proposed in the respective zones. The proposed reservoirs (ELSRS) are:

Existing Reservoirs which are considered:

250 KL ELSR at Kalakshetram in Zone II

Proposed Reservoirs:

i. 900 KL ELSR at Mannar Poluru in Zone I
ii. 1200 KL ELSR at Kalakshetram in Zone II
iii. 300 KL ELSR at Sullur Harijanawada in Zone II
iv. 1100 KL ELSR at Ragavayya Pond in Zone III

Clear Water Gravity Mains

The Transmission Mains from the Balancing Reservoir to the Zonal Reservoirs are proposed and designed for the ultimate requirement for the year 2048. All the Clear Water Gravity Mains are proposed with DI K7 pipes.

Distribution Network

The town area is divided in to 3 zones for the conveying of equitable distribution of water. The Distribution Network is designed as per zonal wise demand for the year 2048 i.e. ultimate year with EPA Net Software. The existing distribution pipelines are not considered, since they are of old one and also not to the required design capacity. The length of the total HDPE line is -75.84 km.

House Service Connections

Provision of House Service Connections are also included in the Estimate. The Total no. of HSC s provided are 4100 nos.

Sludge generation and disposal

It is estimated based on the submitted design that an amount of 0.13MLD of sludge will be generated. The generated sludge will be properly utilized after drying it in sludge drying beds. The sludge will be given to the farmers as a fertilizer.

Miscellaneous

All the Miscellaneous items are estimated, and provisions are made in the project such as power lines, staff quarters, protection walls, land acquisition, payments to the other departments etc.,

3.5 Analysis of Alternatives

Summary of Alternative Analysis

Since the scope of the project is laying of rising mains, construction of water storage reservoirs, laying of pipes for distribution, the environmental impact is low. Practically in all the isolated project locations, Sullurpeta Municipality land is considered, therefore displacement of any community does not arise, or no alternative sites need to be selected. The laying of pipeline will be done within Right of Way (ROW) which results no encroachment of land in project area near Sullurpeta. In the screening exercise, areas of concern- congested place on the sides of the road, existence of sensitive area, extent of physical displacement if any, etc. was studied in detail. The findings have

been used as inputs for engineering design to change the alignment of pipeline within the technical requirements and cost effectiveness. The criteria selected for selection of alternatives from Intake well to Distribution is given in the Table 3.5.

Table 3.5 Summary of Alternative analysis

Working components	Location options	Selected option	Reason of selection
Intake well	Construction of proposed intake well at Telugu Ganga canal on river Tungabhadra to meet the proposed project requirements.	Location at Telugu Ganga canal	Plain land owned by the Sullurpeta Municipality; no additional analysis is required as this is the best place to tap the water from the source.
Raw water rising main from Intake well to WTP	This is planned to transmit raw water to WTP by pumping.	Shortest route, design consideration and minimal social and environmental issues.	Follow along the road alignment/ vacant land – no impact on agricultural land Easy to access near project sites No land acquisition is needed Alignment selected as per design considerations. Gravity based transit of water is the advantage
Three new Elevated Service Reservoirs (ELSRs)	It is proposed to construct one new distribution reservoir of 900 Kl at Mannar Poluru in Zone-1 ,1200 Kl at Kalakshetram in Zone-2, 300 KL at Sullur Harijanawada in Zone-2, 1100 Kl at Raghavayya pond in Zone-3.	Selected as per the design considerations and also for meeting 40% demand by 2033.	3 Zones divided in the Sullurpeta area. ELSR locations selected on the basis of design at different zones and as per the availability of Govt. land for construction of ELSR. These sites are selected because they are at a higher topographic level.
Distribution line	Will be provided along the entire road system in Sullurpeta Municipality for a length of 75.83 Km by covering un-served and replacement areas.	Mandatory to provide water to complete Sullurpeta Area.	Since water is to be supplied to the complete Sullurpeta area, no additional alternative analysis is required.
Water Treatment Plant	Mangalampadu village	Mangalampadu village	Since the option at other places is leading to removal of number of trees the present option has been selected.

CHAPTER – 4

KEY ENVIRONMENTAL IMPACTS

4.1 Identification of Impacts

The purpose of the impact statement is to study and provide information on the nature and extent of environmental impacts arising from the establishment and operation of proposed project and proposing the mitigation measures for the identified impacts. This information shall contribute decisions on the following;

Overall acceptability of any adverse environmental consequences that are likely to arise as a result of the proposed project. Conditions and requirements for the detailed design, establishment and operation of the proposed projects to mitigate against adverse environmental consequences wherever practicable and acceptability of minimized impacts after the proposed mitigation measures is implemented.

The environmental impact study of the establishment activity shall cover all developments within the proposed project sites and any other works associated with these developments outside the study area. The impact prediction shall include specific impacts namely; air quality impact, water pollution impacts, noise impacts, impacts due to solid waste etc.

Most of the individual elements of the sub-project are relatively small and involve straight forward construction and operation, so impacts will be mainly temporary and localized in nature. The proposed project enhances the public health of the project area.

However, the impact study is carried out for the 1) establishment / construction phase and 2) operation phase of the project. The environmental impacts arising from the development on air, water, soil, noise, traffic and socio-economic conditions are systematically examined and evaluated.

4.2 Potential Environmental Impacts and Rises during Construction Phase

Table 4.1 Potential environmental Impacts arises during Construction Phase

S.No	Project Component	Identification of Quantified environment Impacts & Risks	Suggested Mitigation Measures
Physical Environment			
1	Landslide, Soil Erosion and Disturbance of Land	Construction related activity such as digging of trenches for lying of pipes can affect the local land system causing silt runoff. Pending of street surfaces could create problem.	i. Solid waste will be generated, which is about **11.18 MT** per day ii. Disposal of solid waste to nearest temporarily identified low-lying areas very near to the project construction area. iii. Timely back filling of the excavated trenches; iv. Reuse of the excavated earth and proper disposal of the surplus excavated soil. v. The excavated trench will be refilled immediately after laying of pipes and brought back to normal conditions.
Water Quality			
1		Impairment of receiving water quality due to construction activity.	Ensure proper cleaning of construction material and completion of the work before opening to operation
2		Raw Water Rising Main; Clear Water Rising Main; Distribution System; Water Treatment Plant; The Existing Water Treatment Plant is	i. Calculated based on the design provided by the agency that the amount of sludge generated will be **0.13 MLD.** ii. The collected sludge can be used as a fertilizer.

S.No	Project Component	Identification of Quantified environment Impacts & Risks	Suggested Mitigation Measures
		proposed	
3	Water Quality	Water supply activity Impairment of receiving water quality due to mixing of wastewater from domestic waste.	The ULB's water supply system is strengthened by installing WTP to treat the water.
4		Nuisance due to clogging of pipes and formation of mosquito breeding grounds at water leaked areas	i. Ensure timely maintenance of distribution lines. ii. Create awareness among people on how to use the water supply scheme properly and how to report about leakages etc.,
5	Drainage and Waste /water	The ULB predominantly depends on storm water drains for disposal of domestic waste waters. However, sometimes these storm water drains joins in to nearby water bodies and get the water bodies polluted.	A well planned and designed Sewage Treatment plant (STP) is required to protect the water bodies by treating **12.0 MLD** of sewage (At present **2.40 MLD** and after commission of APUWSSMIP **9.20 MLD** of Sewage).
6	Improved Health and Hygiene	Deteriorating water quality and unsanitary conditions are often the causes of water borne communicable diseases. The people in the project area are mostly dependent on water from existing	After the implementation of the project, the health and hygiene of the local people will improve and help reduce occurrence of water borne diseases in the area.

S.No	Project Component	Identification of Quantified environment Impacts & Risks	Suggested Mitigation Measures
		sources such as , wells, tube wells etc. which have high chances of hardness in water more than the standards and contamination.	
Air and Noise Quality			
1	Air and Noise Quality	Trucks, tractors and other vehicles used for the transportation of construction materials will create noise and release emissions. The excavation activities will also release dust. All these effects are temporary and will last for the construction period only.	i. The workers exposed to more than 90-db noise level must be provided with ear plugs. ii. The vehicles used for transportation must be checked for its condition. iii. The equipment will be checked by technicians before the commencement of work and working at night with equipment producing high noise will be prohibited. iv. To minimize dust and particulate matters, sprinkling of water will be done and the construction materials will be covered during transportation to avoid dust generation. v. Also open burning of solid wastes generated particularly from labor camps and construction activities will be completely banned.
2	Air and Noise Quality	Noise, vibration and dust from construction	i. Use of less noise generating equipment for all activities,

S.No	Project Component	Identification of Quantified environment Impacts & Risks	Suggested Mitigation Measures
		activities. Protection of residential / sensitive receptors. At the construction of Intekewell structures, ELSR's , Pipe line laying works dust will be arises	provision for personal protective equipment, earmuffs, etc. for construction laborer's; ii. Provision of enclosing generators and concrete mixers at site. iii. Water spraying activity thoroughly implementing to the work activity zones to arrest the air borne dust. iv. The major noise generating sources are water pumps and diesel generators which will be located at intake points. These intake points are far away from the habitations. The Other expected noise generating sources during construction periods are breakers, batch mix plants, heavy machineries, trucks, dewatering pumps etc... However these activities will be executed during day timings and confined to little periods only.
Biological Environment			
1	Degradation of Cultivated Land and Vegetation	The major structures of the project will be constructed on the land acquired by ULB. There will be no major disturbance of vegetation and There	i. Minimization of vegetation clearing and careful cutting of ground vegetation will be done. In view of the Andhra Pradesh WALTA act, we need to provide twice the number of each tree cut. ii. But it is proposed to plant

S.No	Project Component	Identification of Quantified environment Impacts & Risks	Suggested Mitigation Measures
		are **16 nos. of native plants** having girth size less than 30 cm needs to be cut for proposed project construction works.Some of the topsoil and vegetation may be lost during pipe laying works.	**80 nos. of saplings** in the project which works out to be more than the stipulated norms. These plants will be planted at the empty areas around ELSR, GLBR areas.
Socio-Economic Environment			
1	Employment Generation	Socio Economic Impact	The project will generate direct employment opportunities to the local people of the area. i. The amount of money earned by the local people will directly affect the local economy thereby reducing the chances of seasonal migrations of the local people. ii. The project will provide short term direct employment benefits to the majority of the construction workers and even long term employment to few workers during the operation of the project
2	Skill Enhancement	Socio Economic Impacts ;	i. The construction of the project will not only provide direct employment opportunities but also ensure the transfer of skills and technical proficiency to the local workforce.

S.No	Project Component	Identification of Quantified environment Impacts & Risks	Suggested Mitigation Measures
			ii. The project activities such as constructing tanks, drains, and slope stabilization methods will provide transferable skills.
3	Local Trade and Business Opportunities	Socio Economic Impacts;	i. In order to meet the food and other demands of the construction workers, there will be opportunities to establish small tea shops and eating places around the vicinity of the project area. ii. The demand of the local food items; beverages and other necessary items of the workshop will provide direct benefits to the supplier, farmers and retailers.
4	Increased Economic Opportunities	After the construction of the project, due to improved living conditions, there could be increased migration towards the town from surrounding rural areas which will create opportunities for shops and other business activities in the area.	Due to increased economic opportunities, the land value of the area could increase which will uplift the economic status of the local people.
5	Benefits to Women	Socio Economics Impacts;	i. Women and girls are mainly responsible for household activities such as fetching water and cleanliness. ii. Improved water supply will improve the health and hygiene of women, girls and

S.No	Project Component	Identification of Quantified environment Impacts & Risks	Suggested Mitigation Measures
			the entire household members.
6	Impact to Local Residents	The construction related activities that generates dust, noise and impede access could disturb the local residents. It may also create traffic problems due to traffic jams near the construction site.	i. The local residents will be consulted and informed about the disturbances in advance. ii. Temporary diversions and signboards will be provided for the pedestrians. iii. Traffic management will be done to mitigate the impacts.
7	Problems from Outside Work Force	Haphazard disposal of solid waste and improper sanitary conditions generated by the construction workers .	i. Mechanism of safe disposal of waste will be developed in the project site and construction camps before the actual commencement of work and unwanted littering and discharge of waste will be prohibited. ii. A dustbin in the work site will be provided to collect the waste and then finally disposed to a solid waste carrying vehicle which eventually will be discarded. iii. A separate labor camps shall be set up and organized by contractors near to the project sites. The planned camps shall be maintained as per the approved EHS guidelines and periodic instructions given by supervisory staff. These camps shall also be maintained as per the the COVID -19 pandemic

S.No	Project Component	Identification of Quantified environment Impacts & Risks	Suggested Mitigation Measures
			guidelines issued by Government of India and Government of Andhra Pradesh and other project authorities. iv. The project required amenities and facilities shall be provided to the labors by the contractors. Necessary health checkups and awareness programs shall be provided. The necessary precautions on the gender base violence, sanitation, health etc. shall be taken care by the contractor as per norms.
Occupational Health and Safety			
1	Occupational Health and Safety	During the construction work, the laborers involved in the construction activities may be exposed to different level of health risks and accidents	i. A site health and safety plan will be prepared encouraging the use of safety measures and personal protective equipment (PPE). ii. The labourer will be insured for their health and safety. iii. A first aid box will be kept at a proper and easily accessible place. iv. The general public will be excluded from all the construction sites.
Operational Phase (O&M)			
1	Inadequate Operation and Maintenance	Under suboptimal operations, the Project will create hazards in term of the overall	i. In order to avoid such a state regular O&M of water treatment plants including

S.No	Project Component	Identification of Quantified environment Impacts & Risks	Suggested Mitigation Measures
		delivery of the outputs and safety of the personnel. Under such conditions the existence of the Project will be at risk. The people consuming water from such sources will be at higher risks as the whole population will be consuming the same water.	chlorinators; ii. Regular water quality monitoring of water in the distribution system; Immediate action in case of water quality problems; iii. And training and Operational supervision of system staff will be conducted.
2	Toxic Chemical Hazard	Chlorine and bleaching powder are toxic to humans. Ingestions, inhalations, application to body parts, especially to such parts as eyes, nose and mouth is extremely hazardous.	i. The storage, in-plant handling and dosages of chlorine (bleaching powder) must be addressed and procedures set up and guidelines developed for its handling and first aid measures to be introduced for emergencies and the training and operational supervision of system staff.
3	Repair and Maintenance	Repair of pipe networks will disrupt business in the market area and will be a nuisance to the public. The workers and the public will be at risks from accidents.	i. In order to avoid such issues people of the area should be informed of any work in advance and avoid work during sensitive times: ii. Provide walkways/bridges for people and vehicles if trenches have to be dug; iii. Provide diversions with the help of the police; iv. Complete works quickly in sensitive areas. Also workers are to be provided with health and safety

S.No	Project Component	Identification of Quantified environment Impacts & Risks	Suggested Mitigation Measures
			measures to avoid risks from accidents at sites during pipe repairs and installation of new connections.
4	Sludge Management	The sludge produced during the operation of the treatment plant, if disposed haphazardly will create an unsanitary situation and effluent after backwash water after treatment will create soil erosion.	i. A small sludge collection pit will be designed and proposed at the drain to collect the washed sludge. ii. The collected sludge can be used as a fertilizer. iii. The WTP effluents shall be characterized for particle composition along with the other chemical parameters. iv. The sludge disposal mechanism will be chosen either by dry disposal or wet disposal depends upon the percentage of particle in the Effluents. v. The effluents shall also be characterized to understand about the nature of the effluents and for identification of appropriate technologies such as manure preparation, dry cakes for usage as fuels etc.

4.3 IMPACTS DURING CONSTRUCTION AND OPERATION STAGES:

Air Quality Impacts:

Air quality impacts associated with the establishment / construction and operation of the proposed Water Supply are studied. Worst case impacts on the representative receivers have been assessed. Two major sources of air pollution have been identified namely construction dust emission and road

traffic emissions. The sources of air pollutants at the different phases of the development are categorized as follows;

Establishment / Construction Phase Impacts

The principal potential source of air quality impact arising from the establishment / construction of the proposed project is fugitive dust generation. The dust, measurable as Total Suspended Particulate Matter and Respirable Suspended Particulates would be generated as a result of construction activities during the construction phase of the projects.

The potential dust sources associated with construction activities are loading and unloading of the materials, topsoil removal, travel over unpaved roads and wind erosion etc. The construction works associated with the proposed development are broadly given below.

i. Site development and foundation works including excavation
ii. Dust generation due to vehicles bringing raw materials
iii. Un loading of raw materials, removal of unwanted waste material from site

From the above activities it is not expected any significant impacts on the air quality of neighborhood. However, adequate mitigation measures are suggested to overcome the air quality issues.

Operation Phase Impacts

Absolutely no impact on air quality is expected during operation phase of the project.

Water Quality Impacts:

Establishment / Construction Phase Impacts

Source of Water Supply is Telugu Ganga Canal. The construction activity of the Water Supply will not have any impact on water environment in the project area.

During Operation Stage

Absolutely no impact on water quality is expected during operation phase of the project.

Noise Levels impacts:

Establishment / Construction Phase Impacts

The major activities which produce periodic noise, during establishment / construction phase are as follows:

i. During Demolition of Existing Utilities such as old unused pipeline etc
ii. Operation of construction equipment
iii. Movement of vehicles

Solid Waste Impacts:

Establishment / Construction Phase Impacts

The category of waste in the proposed project due to different types of raw materials being used during establishment stage in general may comprise the following

i. Debris from demolition of existing utilities
ii. Cement concrete
iii. Bricks, tiles, sand, stone, timber/wood, paints/varnishes.

Besides above there are minor components namely conduits, pipes, electrical fixtures, panels, etc in all the proposed project.

The Proposed project in Sullurpeta Municipality ULB approximate quantity's of construction materials may used. Reinforcement is 109.1 Metric Ton and Cement is 2069.55 Metric Ton.

The construction schedule of proposed project is about 24 months from starting date to ending date.

During Operation Phase

Absolutely no impact of solid waste on environment is expected during operation phase of the project.

Impact due to Traffic Diversion

During construction phase the traffic is to be directed from the work location which leads to congestion of main roads. These impacts will however is short term and limited to the traffic diversion period.

Impact on biological environment:

Establishment / Construction Phase Impacts

The activities of the construction phase will have impact on flora and fauna of the area.

The trees which are coming in the right of the way of the pipeline laying and also at the construction sites of ELSRs and GLBRs will be affected and thus may needs to be removed. However, the removal of trees will be compensated with the proposed compensatory plantation with budgetary provision in the Environment Management Plan.

With reference to the fish population available at the intake well area, the impact will be minimal as necessary precautionary measures will be taken like placing the wired meshes. However, with regard to other faunal species, very less impacts are anticipated. Necessary protective measures should be taken in the case of Near Threatened/ Vulnerable Species of Fauna.

During Operation Phase

Absolutely no impact on biological environment is expected during operation phase of the project. Moreover, the compensatory plantation may increase the faunal species based on the increased availability of water.

4.4 Existing Drainage Systems in Urban Local Bodies of Andhra Pradesh

Need for the Drainage Systems in Urban Areas:

The prime function of the Urban Local Body (ULB) is to provide basic amenities to its citizens and undertake the construction of large number of public utility services. Supply of portable water is one of the most important services of the ULB as water is most essential for survival. For a long-time,

people in the ULBs depended on wells, tanks, ponds and rivers for water. The system of supplying water through pipes was adopted since long ago, 19th century onwards in India.

The supply of potable water leads to increase in drainage levels particularly in the vicinity of the thickly populated urban agglomerations. The well planned and designed drainage systems remove the drainage waters and runoffs from urban areas. Hence, the ULBs recognized the need for construction and maintenance of drainage systems to abate odour nuisance and subsequent environmental hazards raised due to sewage and sullage. Eventually providing adequate drainage systems in urban areas has been identified as a essential component in maintaining the overall health, welfare, and economic well-being of a Urban areas.

The Urban Drainage Scenario in the State of Andhra Pradesh:

The National Urban Sanitation Policy (NUSP) envisaged a key role for the State Governments to develop their state sanitation strategies by recognizing the water and sanitation problems existing across urban local bodies in the state. Under NUSP, the AP State Sanitation Strategy (AP SSS) recognizes primacy to integral solutions that covers sub sectors of solid waste, waste water (including septage), storm water drainage and drinking water. There are various initiatives undertaken in the sector of water and sanitation in the state of Andhra Pradesh which have been facilitated and supported by Commissioner and Director of Municipal Administration (C&DMA).

As per the census 2011,

Approx. 85.14 percent of urban Households (HHs) in Andhra Pradesh have access to toilets as compared to national figure of 81.4 percent.

Approx. 18.07 percent of Andhra Pradesh urban population have connected to Piped Sewerage networks (Under Ground Drainage).

Only 8 cities have existing partial Underground Drainage facility. Sewerage facility in 3 towns (Guntur, Narasaraopet and Nellore) of Andhra Pradesh is under implementation. Lack of formal mechanism and improper septage management is leading to disposal of sewage and septage into water bodies in and around the cities without any treatment in more than 100 ULBs of the state.

4.5 Existing Drainage System in Sullurpeta Municipality ULB:

The town has no dedicated sewerage system and septage management. The following drainage issues are identified broadly and described as follows:

i. There is no Sewage collection/Septage and Treatment system.
ii. Most of the houses are provided with individual septic tanks and there are a few public toilets.
iii. Sewage flows into the septic tanks and its supernatant overflows in to storm water drains.
iv. The sewage and sullage from the residential areas are presently discharged into Irrigation canal/ Sullurpeta Municipality drain which may degrade the water quality.
v. The effluent of septic tanks is flushed into the open drains or low lying areas.

As per the Census 2011, the population of the ULB is 45836. The estimated population to the base year 2018(including floating population) is 52305. With respect to sanitation system, most of the town's households are covered with individual toilets. A small proportion of the slum population defecate in the open.

Presently, the town predominantly depends on storm water drains for disposal of waste water. These storm water drains are designed to withhold the waters 10 to 15 percent excessively to meet the present and future unforeseen demand during peak rainy seasons. Hence, the sewage collected through the storm water drains is being let into the nearby Canal/ Sullurpeta Municipality Drain. Hence these drains may contaminate the nearby water bodies in the ULB.

However, sometimes these storm water drains joins in to nearby water bodies and get the water bodies polluted. To avoid this type of future scenario, and to treat the sewage during operational phase of the proposed APUWSSMIP and also the septage, a well planned and designed Sewage Treatment plant (STP) is required. Presently, there is no STP .To protect the water bodies in the ULB, a Sewage Treatment plant (STP) needed to be installed to treat 12.0 MLD of sewage (At present 2.40 MLD and after commission of APUWSSMIP 9.20 MLD of Sewage).

4.6 Mitigation Measures:

Air Quality:

Establishment / Construction Phase II

i. For the proposed project site clearance, excavation, site leveling, and grading will be carried out before the water supply lines are laid. According to the engineering assessment; most of the excavated material shall be carted within the project area or will be utilized for filling in low lying areas in the city. The movement of cut and fill material will be limited.

ii. Most of the construction dust will be generated from the movement of construction vehicles on unpaved roads. Unloading and removal of soil material shall also act as a potential source for dust nuisance. The control measures proposed to be taken up are given below.

iii. The important dust suppression measures proposed will be regular water sprinkling on main haul roads in the project area, this activity will be carried out at least twice a day, if need arises frequency will be increased on windy days, in this way around 50% reduction on the dust contribution from the exposed surface can be achieved.

iv. Temporary tin sheets of sufficient height (3m) will be erected around the site of dust generation or all around the project site as barrier for dust control.

v. All the vehicles carrying raw materials will be covered with tarpaulin / plastic sheet, unloading and loading activity will be stopped during windy period.

vi. To reduce the dust movement from construction site to the neighborhood the external part of the site will be covered by plastic sheets.

Given the implementation of proper control measures for dust suppression, no adverse impacts are expected and compliance to maintain the Ambient Air Quality is achieved at all times.

Noise Quality

Establishment / Construction Phase

During construction phase, sources of noise pollution will be due to demolition of existing utilities such as unused pipeline, structures etc, movement of construction equipment, concrete mixers. This

might cause nuisance to the occupants of nearby areas. The following measures will be adopted to mitigate the impact:

i. Use of equipment generating noise of not greater than 90 dB (A).
ii. The construction activities will be restricted to the daytime and no construction will be practiced during night.
iii. Installation use and maintenance of mufflers if possible, on noisy equipment.
iv. Workers working near high noise construction machinery will be supplied with earmuffs/ear plugs
v. Barricades will be provided around the construction site to confine noise within the site

During Operation Stage:

There are no potential noises impacts that are expected during operation stage in the project area.

Water Quality

Establishment/Construction Phase

The following mitigation measures will be followed during construction phase to mitigate the impact on water contamination

i. Avoid excavation during monsoon season
ii. No discharge of wastewater to soil and ground water body
iii. During site development necessary precautions will be taken, so that the runoff water from the site gets collected to catch pit and if any overflow same will be diverted to nearby greenbelt / plantation area

Solid Waste Management

Establishment / Construction Phase /Operation Phase

The solid waste generated during this period being predominantly inert in nature, construction and demolition waste does not create chemical or biochemical pollution. Hence maximum effort would be made to reuse and recycle them. Most of the solid waste material can be used for filling/ leveling of low-laying areas. All attempts shall be made to stick to the following measures.

i. All construction waste shall be stored within the site itself. A proper screen will be provided so that the waste does not get scattered.
ii. Attempts will be made to keep the waste segregated into different heaps as far as possible so that their further gradation and reuse is facilitated.
iii. Materials, which can be reused for purpose of construction, leveling, making roads/ pavement will also be kept in separate heaps from those which are to be sold or land filled.
iv. The silt generated from desilting activity will be land filled at the exiting solid waste dumping site.
v. The Chemical Waste generated from the WTP will be hazardous in nature and will be handed over to the APPCB authorized vendor by the ULB. This waste will be stored, transported and disposed off as per the provisions of the Hazardous and Other Wastes (Management and Transboundary movement) Rules, 2016 and its amendments

Traffic Diversion

The following precautions shall be taken due to traffic diversion during construction.

i. Reduce speed through construction zones.
ii. Proper cautionary signs shall be displayed at construction sites. Diversion roads will be provided wherever needed
iii. The construction site is provided with barricades.

Vegetation

The proposed pipeline is selected along the side of the existing roads on the government land. During the design stage, alignment is selected so as to have minimum tree cutting. However, trees shall not be removed unnecessarily to build the trenches, and to mitigate any such losses if unavoidable, the Contractor shall be required to plant and maintain FIVE new tree saplings (of the same species) for each one that is felled.

In order to compensate the no. of trees lost due to the construction activity, it is proposed to plant 5 times the no. of saplings to be removed, which is far more than the requirement of WALTA Act.

There are**16 nos.** of native plants having girth size less than 30 cm needs to be cut for proposed project construction works. But it is proposed to plant **80 nos. of saplings in the project** which works out to be more than the stipulated norms. These plants will be planted at the empty areas around ELSR, GLBR and Water Treatment Plan areas.

Environmental Sensitive Areas

A pipeline proposed Raw water 600mmdia DI K7 Gravity Main from sai canal to proposed SS tank at Mangalampadu Irrigation tank . The alignment of Gravity main runs all along R&B road from Sri kalahasthi to BN kandriga Road. The forest land falls in two stretches along the R&B road ie CH.6 /400 to 6/900 and from Ch. 11/700 to 13/200. In this connection, the Executive Engineer PHMED, Nellore has sent a Letter to the District Forest Officer, Nellore Seeking Permission to lay the water supply pipeline all along the R&B road which is along the reserve forest area. The concerned letter No.NLR/AIIB/DB/ATO/2019/231 Dt:30.06.2020. The concerned letter is attached as **Annexure-III**

4.7 Public Health and Solid Waste Management

i. Existing Municipal Solid waste Disposal in Sullurpeta Municipality ULB:
   a. In Sullurpeta Municipality the existing disposal site for municipal solid waste is Dumping Yard at Beside NH5 Road.
   b. Daily 19.5 Metric Tonnes (Wet Waste – 12.6 MT & Dry Waste-6.5 MT) of municipal solid waste is being generated in Sullurpeta municipality

ii. Proposed Municipal Solid waste Disposal in Sullurpeta ULB:
   a. In Sullurpeta Municipality the Proposed disposal site for municipal solid waste is Dumping Yard at Vatra Palem.
   b. Solid Waste to vermi compost units was sanctioned by SAC and work to be started.

iii . **Coronavirus disease 2019 (COVID-19)** is a respiratory illness caused by a virus. The virus is spreading mainly from person to person. The Covid 19 pandemic and mitigation measures will be adopted at construction sites as per guide of Government of India. Ministry of Personnel, Public Grievances and Pensions (Department of Personnel and Training) Issued the Guidelines:

COVID-19 Preventive Measures to be Taken:-

Do's

i. Maintain personal hygiene and physical distancing.

ii. Encouraging all the workers and person involved to do frequent hand washing with soap and water or use alcohol-based hand rub. This practice is to be followed irrespective of hands appearing visibly clean.

iii. Strict instruction will be given to all to cover nose and mouth with handkerchief/tissue while sneezing and coughing.

iv. Disposing off tissues into closed bins immediately after the usage.

v. Maintenance of safe distance (at least 1-2m) from persons during interaction/meeting, especially with those having flu-like symptoms.

vi. Sneezing/coughing into the sideways of the either side of arm instead of into the palms.

vii. Check the temperature on the regular basis and report in case of any respiratory symptoms. Immediately visit the nearest hospital/health-centre and diagnosed by the doctor in case of feeling unwell (fever, difficulty in breathing and coughing). While visiting doctor, wear a mask/cloth to cover mouth and nose.

viii. For any fever/flu-like signs/symptoms, call State helpline number or 24x7 helpline number of the Ministry of Health & Family Welfare at 011-23978046.

Don'ts

i. Shake hands.

ii. Have a close contact with anyone, especially experiencing cough and fever.

iii. Touching eyes, nose and mouth.

iv. Sneeze or cough into palms of your hands.

v. Spit in Public.

vi. Travel unnecessarily, particularly to any affected region/containment zones.

vii. Participate in large gatherings, including sitting in groups at canteens.

viii. Visit gyms, clubs and crowded places etc.

ix. Spread rumours or panic.

CHAPTER- 5

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

5.1 Environmental and Social Management Planning Framework (ESMPF)

Design Consultants are obliged to produce Request for opinion regarding necessity of EIA procedure for each sub-project which is found to be completely or partially placed adjacent or within the nature/cultural protected area. Decision will provide this Request to implementing agencies together with other relevant project documentation, which mandatory include preconditions of institutions in charge of the environmental protection. Based on the extent of environmental impact obtained from the environmental screening, the decision for further environment impact assessment will be made. EIA procedure is needed for the particular sub-project –Consultants will prepare EIA Study and complete public disclosure process (as outline herein). The EIA Study should include, but not be limited to:

Project Description: Description of the existing as well as proposed scenario in respect to right of way, water supply, distribution network, planned drainage works, cross drainage structures, community facilities, traffic projections etc.

Environmental Regulatory Framework: Presents the legal and administrative framework of the GoAP and AIIB environmental guidelines. This section should present various approvals applicable for the project.

Analysis of Alternativesto be carried out during feasibility stage, covered in the Environmental screening and scoping report, and the approved alternative to be discussed in detail along with environmental attributes under impact.

Baseline Environmental Status, the existing environmental conditions, by conducting a recognizance survey along with collection of secondary information. Primary data for various environmental parameters is to be generated using suitable monitoring devises.

Environmental Impacts, addressing all the anticipated impacts on the physical and social environment of the sub project. The quanta of all the impacts on natural environment and social/cultural environment.

Mitigation Measures

The assessment methods shall be capable of identifying and evaluating mitigation measures in order to avoid, reduce or remedy the impact defining the residual environmental impact, which is the net impact remaining with mitigation measures in place.

ENVIRONMENTAL IMPACTS AND ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Identification of Impacts

The purpose of the impact statement is to study and provide information on the nature and extent of environmental impacts arising from the establishment and operation of proposed project and proposing the mitigation measures for the identified impacts. This information shall contribute decisions on the following;

Overall acceptability of any adverse environmental consequences that are likely to arise as a result of the proposed project. Conditions and requirements for the detailed design, establishment and operation of the proposed projects to mitigate against adverse environmental consequences wherever practicable and acceptability of minimized impacts after the proposed mitigation measures is implemented.

The environmental impact study of the establishment activity shall cover all developments within the proposed project sites and any other works associated with these developments outside the study area. The impact prediction shall include specific impacts namely; air quality impact, water pollution impacts, noise impacts, impacts due to solid waste etc.

Most of the individual elements of the sub-project are relatively small and involve straight forward construction and operation, so impacts will be mainly temporary and localized in nature. The proposed project enhances the public health of the project area.

However, the impact study is carried out for the 1) establishment / construction phase and 2) operation phase of the project. The environmental impacts arising from the development on air, water, soil, noise, traffic and socio-economic conditions are systematically examined and evaluated.

5.2 Environmental Monitoring Plan during Project Implementation

Pre-construction phase

The environmental monitoring program is a vital process of any Environmental Management Plan (EMP) of development project for review of indicators and takes immediate preventive action. This helps in signaling the potential problems resulting from the proposed project activities and will allow for prompt implementation of corrective measures. APUFIDC has keen interest in environmental monitoring as it is an integral part towards better environmental management of air, noise, water quality etc., both during construction and in operation.

Generation of dust and noise are two main issues during any large construction activity. Degradation of water quality is another. During construction, management of dust was carried out by monitoring Suspended Particulate Matter. Now, the same is being done by monitoring Particulate Matter (size less than 10microns). Similarly, for example, noise monitoring is carried out by recording dB(A) values. The parameters are monitored in pre-construction, construction and operation phase and are based on the need to evaluate the deviation of environmental conditions from baseline environmental conditions due to construction and operation of the infrastructure components. If it is observed that environmental conditions are deteriorating, then proper mitigation measures will be taken.

The monitoring parameters are thus those that are generally impacted during construction activities. Impact monitoring during construction help to discipline the contractors and assist them in meeting their contractual obligations. Construction phase monitoring data is also intended to evaluate the efficacy of some control mechanisms found in the environmental manual which are then either modified, upgraded or deleted. Monitoring is also extended to the operational phase, to ascertain the impacts over a long-term period. These parameters are also of immediate public concern. Over a period, much environmental monitored data has been generated and is also of academic interest. The data is much sought after by Institutions, NGOs and interested public. The environmental

monitoring will be required during both construction and operational phases. The following parameters are proposed to be monitored:

i. Water Quality,
ii. Air Quality,
iii. Noise
iv. Soil Quality
v. Workers health and safety

Environmental monitoring during pre-construction phase is important to know the baseline data and to predict the adverse impacts during construction and operations phases. Pre-construction phase monitoring has been done for the proposed project for air, noise, water, soil quality and ecology. The results so obtained will be discussed in the baseline studies chapter.

During construction stage, environmental monitoring will be carried out for air quality, noise levels, water quality, and ecology. Environmental monitoring should be carried out at the locations where baseline monitoring was carried-out.These numbers could be modified based on need when the construction commences. The contractor shall ensure daily, weekly and monthly environmental monitoring, mitigation & management measures for preparing monthly report, the PMC personnel would consist of a dedicated Environmental Specialist to monitor the compliance throughout the construction phase of the project and report the same to the PMC/ Sullurpeta ULB. The monitoring program shall also be conducted by third party on a random sample basis covering 20% of sampling requirements in addition to, and independent of the tests that need to be carried out by the contractor as specified in the EMP under the supervision of PMC/Sullurpeta ULB.

Water Quality

Since water contamination leads to various water related diseases, the project authorities shall establish a procedure for water quality surveillance and ensure safe water for the consumers. The water quality parameters are to be monitored during the entire period of project construction. Monitoring should be carried out by NABL certified private or Government agency. Water quality should be analyzed following the procedures given in the standard methods. Parameters for Surface water quality monitoring will be as per IS: 2296 and for Ground water quality monitoring will be as per IS: 10500. The monitoring points could be ground and surface water.

Air Quality

Air quality should be monitored at the locations of baseline monitoring as reported in baseline studies. The parameter recommended is Particulate Matter (PM_{10}). The contractor will be responsible for carrying out air monitoring during the entire construction phase under the supervision of Sullurpeta ULB.

Noise Quality

The noise will be monitored at construction sites for entire phase of construction by the site contractor and under the supervision of Sullurpeta ULB.

Soil Quality

Soil quality should be monitored at the locations of baseline monitoring as reported in baseline studies chapter.

Workers health and safety

Monitoring of health risk issues that might arise throughout the project lifetime will be done. Epidemiological studies at construction sites and workers camp will be performed to monitor the potential spread of diseases. Regular inspection and medical checkups shall be carried out to worker's health and safety monitoring. Any reoccurring incidents such as irritations, rashes, respiratory problems etc., shall be recorded and appropriate mitigation measures shall be taken. Contractor will be the responsible person to take care of health and safety of workers during the entire period of the construction and project proponent shall review/ audit the health and safety measures/ plants. However, supervision agency for workers health and safety is the project proponent, Sullurpeta ULB, which should include site representation, compliance monitoring, training and incident management.

Environment Monitoring Program

In order to monitor an environmental impact in the project, an effective monitoring program is essential. The environmental monitoring program will consider the following:

i. Summary of environmental monitoring, for all phases of the project viz. construction and operation.

ii. Technical aspects of monitoring for achieving effectiveness in mitigation measures.
iii. Requirement of monitoring facilities and methods adopted.
iv. Frequency, location, parameters of monitoring.
v. Compilation and analysis of data and reporting system.
vi. Procurement schedules and budgets in detail.
vii. Training requirements.

The EMP will primarily be implemented by the Project Proponent & Civil Contractor. However, for an effective implementation of EMP, it is proposed to have two level monitoring. The first one is internally by the top management of Contracting Agency and the second one by the Sullurpeta ULB. The environmental monitoring schedule is included in the Environment Management Budget.

The detailed Environment Management Plan is placed in Table 5.1.

Table 5.1 Detailed Environment Management Plan

Activity and Potential Negative Impact / Concern	Mitigation Measures	Reporting	Supervision Institution	Implementation
Construction Phase				
Mining for construction materials	Ensure that construction materials (sand, aggregate and gravel) are obtained from quarries licensed by Geology and Mining Departments	Monthly	Sullurpeta ULB/ PMC	Contractor
Excavation activities: Soil and water contamination due to improper disposal of excavated	The disposal of soil, de-silted material and construction waste shall be strictly deposited into the identified low-lying areas very near to the project site. Ensure immediate disposal of accumulated waste in the above identified low lying areas	Weekly	Sullurpeta ULB/ PMC	Contractor

Activity and Potential Negative Impact / Concern	Mitigation Measures	Reporting	Supervision Institution	Implementation
material.	near to project construction area			
Shifting of common utilities	Ensure community consensus and minimum impact to common utilities like telephone cable, electric cables, electric poles, water taps etc.,	Monthly	Sullurpeta ULB/PMC	Contractor
Storage of materials	Site for storage of construction materials to be identified, without affecting the traffic and other common utilities	Monthly	Sullurpeta ULB/ Contractor	Contractor
Barricading site	The construction site should be barricaded at all time in a day with adequate marking, flags, reflectors etc. for safety of general traffic movement and pedestrians at the contractor's expenses, to the entire satisfaction of the Municipal Engineer.	Monthly	Sullurpeta ULB/PMC	Contractor
Dust Pollution near settlements	i) All earth work will be protected in manner acceptable to the Municipal Engineer to minimize generation of dust.	Monthly	Sullurpeta ULB/PMC	Contractor
	ii) Construction material shall be covered or stored in such a manner to avoid being affected by wind direction.			

Activity and Potential Negative Impact / Concern	Mitigation Measures	Reporting	Supervision Institution	Implementation
	iii) Trucks carrying construction material to be adequately covered to avoid the dust pollution and to avoid the material spillage			
Temporary flooding during construction activity.	In all the proposed water supply pipes and sewerage network drains, the desilting activity shall be scheduled during non-flooding season by the Contractor.	Weekly	Sullurpeta ULB/ PMC	Contractor
	Provide suitable arrangements for drainage control in all the proposed project activities.			
Planning of temporary Traffic arrangements	i) Temporary diversion will be provided with the approval of the Municipal Engineer. Detailed traffic control plans will be prepared and submitted to the engineers for approval, one week prior to commencement of works.	Monthly	Sullurpeta ULB/PMC	Contractor
	ii) The traffic control plans shall contain details of temporary diversion, details of arrangements for construction under traffic, details of traffic arrangement after cessation of work each day			

Activity and Potential Negative Impact / Concern	Mitigation Measures	Reporting	Supervision Institution	Implementation
Noise, vibration and dust from construction activities. Protection of residential / sensitive receptors.	Use of less noise generating equipment for all activities, provision for personal protective equipment, earmuffs, etc. for construction laborer's; Provision of enclosing generators and concrete mixers at site.	Monthly	Sullurpeta ULB/ PMC	Contractor
Health hazards due to hazardous nature of silt Safety of labor.	Provide adequate safety precautions such as helmets, safety shoes, gloves, etc. to the workers working the area.	Monthly	Sullurpeta ULB/ PMC	Contractor
Vehicular noise pollution	i) Idling of temporary trucks or other equipment should not be permitted during periods of loading / unloading or when they are not in active use. The practice must be ensured especially near residential / commercial / sensitive areas.	Monthly	Sullurpeta ULB/ PMC	Contractor
Impairment of receiving water quality due to construction activity	Ensure proper cleaning of construction material and completion of the work before opening to operation.	Monthly	Sullurpeta ULB/ PMC	Contractor
Impact on the trees adjacent to the proposed Project construction	Identify priority trees for protection. Mark their locations on the base map and sketch in approximate Tree Protection Zones (TPZs) where temporary	Monthly	Sullurpeta ULB/ PMC	Contractor

Activity and Potential Negative Impact / Concern	Mitigation Measures	Reporting	Supervision Institution	Implementation
works	fences should be located around priority trees.			
	Maintain a radius of at least 1.25 feet of protected area for each inch of trunk diameter.			
	Mark trees that need to be partially removed or pruned to make room for future structures and construction equipment.			
	Do not store construction equipment or materials in TPZs.			
	Monitoring of the trees till it is handed over to the ULB.			
	Budgetary provision of Rs. 6.50 lakhs are made in the EMP for compensatory plantation and Green belt development of the proposed project.			
Muck / Waste earth Disposal Due to proposed project construction works, there is about **11.18 MT of muck / waste earth**	i. The carting away / disposal of solid waste to nearest low-lying areas very near to the project construction area.	Weekly	Sullurpeta ULB/ PMC	Contractor
	ii. A total provision of Rs. 8.5 lakhs made in the capital cost of the project for proposed activity.			

Activity and Potential Negative Impact / Concern	Mitigation Measures	Reporting	Supervision Institution	Implementation
disposal is likely generated.	iii. Top priority will be given to reuse the debris/ solid waste material in the project i.e., development of existing service roads, development of landscaping in the available ULB lands.			
Construction Camps; Health impacts due to absence of housing and sanitation facilities in labor camps for the proposed project.	Laborers' residing in the camps shall be provided with safe drinking water, adequate sanitation facilities, Gas for cooking and all other amenities as per the prevailing Labor laws. Domestic waste generated from the camps will be treated as per IS-2470 norms.	Quarterly	Sullurpeta ULB/ PMC	Contractor
Risk from Electrical Equipment(s)	The Contractor shall take all required precautions to prevent danger from electrical equipment and ensure that – i) No material will be so stacked or placed as to cause danger or inconvenience to any person or the public. ii) All necessary fencing and lights will be provided to protect the public in construction zones.	Monthly	Sullurpeta ULB/ PMC	Contractor

Activity and Potential Negative Impact / Concern	Mitigation Measures	Reporting	Supervision Institution	Implementation
	iii) All machines to be used in the construction will conform to the relevant Indian Standards (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Engineer			
Impacts on surrounding environment due to improper drainage and solid waste management facilities in construction camps.	Temporary drainage facilities will be provided, and solid waste collection and disposal facilities will be provided at the construction site.	Quarterly	Sullurpeta ULB/ PMC	Contractor
Safety Aspects	i) All machines used shall confirm to the relevant Indian standards Code and shall be regularly inspected by the Municipal Engineer.	Monthly	Sullurpeta ULB/ PMC	Contractor
	ii) Where loose soil is met with, shoring and strutting shall be provided to avoid collapse of soil.			

Activity and Potential Negative Impact / Concern	Mitigation Measures	Reporting	Supervision Institution	Implementation
	iii) Protective footwear and protective goggles to all workers employed on mixing of materials like cement, concrete etc.			
	iii) Welder's protective eye-shields shall be provided to workers who are engaged in welding works.			
	iv) Earplugs shall be provided to workers exposed to loud noise, and workers working in crushing, compaction, or concrete mixing operation.			
	v) The contractor shall supply all necessary safety appliances such as safety goggles, helmets, safety belts, ear plugs, mask etc to workers and staffs.			
First Aid	The contractor shall arrange for:	Monthly	Sullurpeta ULB/ PMC	Contractor
	i) A readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone			
	ii) Availability of suitable transport always to take injured or sick person(s) to the nearest			

Activity and Potential Negative Impact / Concern	Mitigation Measures	Reporting	Supervision Institution	Implementation
	hospital			
Site Restoration	On completion of the works, all temporary structures will be cleared away, all rubbish cleared, or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the contractor's expenses, to the entire satisfaction of the ULB Engineer.	Monthly	Sullurpeta ULB/ PMC	Contractor
Operation Phase				
Water supply activity Impairment of receiving water quality due to mixing of wastewater from domestic waste.	The ULB's water supply system is strengthened by installing WTP to treat the water.	Quarterly		Sullurpeta ULB / Contractor
Nuisance due to clogging of pipes and formation of mosquito breeding grounds at water leaked areas.	1. Ensure timely maintenance of distribution lines. 2.Create awareness among people on how to use the water supply scheme properly and how to report about leakages etc., A budget provision of Rs. 1,50,000 is made for the same	Quarterly	Health Department	Sullurpeta ULB / Contractor

Activity and Potential Negative Impact / Concern	Mitigation Measures	Reporting	Supervision Institution	Implementation
Tree Plantation /Protection of Trees. There are**16nos.** of native plants having girth size less than 30 cm needs to be cut for proposed project construction works	In view of the Andhra Pradesh WALTA act, we need to provide twice the number of each tree cut. But it is proposed to plant **80nos. of saplings in the project** which works out to be more than the stipulated norms. These plants will be planted at the empty areas around ELSR, GLBR and WTP areas.	Monthly	Sullurpeta ULB/ PMC	Contractor
Sludge disposal	Necessary sludge disposal mechanism will be in place for sludge handling and disposal. It will be distributed to farmers which can be used as a fertilizer.	Monthly	Sullurpeta ULB/PMC	Contractor

Intake well:

Construction Technology

The new Intake well are proposed to be constructed where sand depth is more than 2m, the sand should be free from silt. Uniformity coefficient should be between 2.4 to 2.65. The proposed Riverbed satisfies all the above required criteria. Hence intake well is proposed.

Associated Environmental Impacts

i. There is a temporary disturbance of the air & noise environment during the construction Intake well in the bed of Sunkesula reservoir Collection well cum Pump house. All the heavy

equipment and machinery used in the project i.e., earth movers, cranes, dozer, tippers, generators etc., should satisfy Bharath Stage –II or III air and noise norms to mitigate the pollution.

ii. It is observed that no habitations exist near the intake well. No forest land exists in the sub-component area. No comments received during the stakeholder meeting on Intake well.

Major Observations

Applicable Acts during construction and operation phases:

i. Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 &1988.
ii. The Environment (Protection) Act, 1986 and further notifications issued under this Act.
iii. No environmental sensitive areas involved in the sub-component area.
iv. No community concern observed.

Clear Water Pipeline:

Construction Technology (For all pipelines)

Trenches will be dug using a backhoe digger, supplemented by manual digging where necessary. Excavated earth will be placed alongside, and the pipes (brought to site on trucks and stored on unused land nearby) will be placed in the trench by hand or using a small rig for the larger Ductile Iron (DI) pipes. Pipes will be joined by hand, after which sand from local quarries will be shoveled into the trench beneath and around the pipe for support and protection. Excavated earth will then be replaced manually on top of the pipe and compacted by a vibrating compressor. Where trenches are dug into an existing roadway, the bitumen or concrete surface will be broken by hand-held pneumatic drills, after which the trench will be excavated by backhoe and the appropriate surface will be reapplied on completion.

Associated Environmental Impacts

i. During construction of pipeline there is considerable dust will be generated & suspended in ambient air and the same can be suppressed by sprinkling of water arrangement.
ii. Due to huge excavation activity, noise levels in the particular area may rise up, it can be mitigated by providing adequate earmuffs to the workers associated with those operations.

iii. During construction noise monitoring shall be carried periodically to check the noise levels. Thus, the environmental impact due to noise pollution will be minimum / temporary and localized in nature.

Major Observations

i. New pipeline will be laid along the existing Right of Way (RoW).
ii. No land acquisition is involved in the sub-project component except, replacement

Cost of structures for the squatters.

i. Applicable Acts during construction and operation phases:
ii. Water (Prevention and Control of Pollution) Act, 1974 - as amended in 1978 &1988.
iii. The Environment (Protection) Act, 1986 and further notifications issued under this Act.
iv. Noise Pollution (Regulation and Control) Rules, 2000.
v. AP Water, Land and Tree (WALT) Act 2002.
vi. No environmental sensitive areas involved in the sub-component area.
vii. No community concern observed

Sludge generation:

As a result of Water Treatment process at Water Treatment Plant, sludge will generate. It is calculated based on the design provided by the agency that the amount of sludge generated will be 0.13 MLD.

Associated Environmental Impacts

i. During operation of Water Treatment Plant, the estimated sludge will be generated and the same will be first placed in sludge thickener which will give dried sludge cakes. The remaining portion will re-circulate in the sludge thickener.

ii. Improper disposal of sludge will lead to several problems. In order to reduce associated environmental problems, the sludge will be given to the farmers which will be used as a fertilizer.

Other Issues:

i. During construction, the noise monitoring shall be carried periodically to check the noise levels. Thus, the environmental impact due to noise pollution will be minimum / temporary and localized in nature.

ii. The proposed site for clear water sump is covered with grass and the number of trees which have to be cut will be compensated with five times to the number of trees cut which is more than the suggested ratio by WALT Act, 2002.

5.3 Proposed Institutional Mechanism during Implementation of EMP

The Institutional Mechanism for implementation of Environmental Safeguards

The Environmental Specialist (ES) in the PMC, has to review, monitor and manage the Environmental aspects and activities at the Project level. At the circle level, the Environmental Associates (EA) will be held responsible to monitor and manage the environmental aspects at circle level and report to the Environment specialist on the progress of the environmental related project activities. In each ULB, the Resident Engineer (RE) of PMC will take the environmental responsibility and closely monitor the package level environmental activities by taking necessary support from AE from PHMED.

The tender awarded contractor shall require to appoint the Environmental expert who shall be held responsible for adoption and implementation of EMP, ESHS and Environmental Safeguards specific to the sub project/package during construction/ implementation of the project. The PMC staff shall prepare periodic reports and submitted to the PMU and AIIB on the implementation of EMP, EHS plans and Safeguard measures by the contractor.

5.4 Budget for Environmental Management Plan Implementation:

The project tender is divided into two work packages i.e, one is from Infiltration well to ELSRs and another is entire distribution system. The EMP implementation budget is Rs.28.25 lakhs is made in the Project cost. The cumulative cost of EMP implementation is Rs.28.25 Lakhs. The details of the Budget implementation with item wise breakup is given in Table 5.2.

Table 5.2 Budget Items for implementation of EMP to be included in the estimate

S.No.	Item	No of Samples	Unit cost/ Lump sum cost (Rs.)	Total cost (Rs.)
I.	**Monitoring Costs: Construction Phase (Two years)**			
	Air Quality Monitoring (2 Monitoring stations) twice in a month for three seasons during the construction period covering Intake well, Sump & PH, WTP, ELSRs, and Distribution network	24	Rs.4,000 per station	96,000/-
	Noise level (5 Monitoring station) once in a month for three seasons during the construction period at Intake well/, Sump & PH, WTP, ELSRs, Pipelines & Distribution network	30	Rs.1,500 per station	45,000/-
	Water Quality Monitoring surface / ground (8 Monitoring stations) once in a month for three seasons during the construction period covering Intake well, Sump & PH, WTP, ELSRs, Pipelines & Distribution network	48	Rs.5,000 per station	2,40,000/-
II.	**Monitoring Costs: Operation Phase (One year)**			
	Air Quality Monitoring (4 Monitoring stations) twice in a year during operation period at Intake well/Off take chamber, Sump & PH, Filtration Plant/WTP, ELSRs, Pipelines & Distribution network	8	Rs. 4,000 per station	32,000/-
	Noise level Monitoring (10 Monitoring station) twice in a year during operation period at Intake well, Sump & PH, WTP, ELSRs, Pipelines & Distribution network	20	Rs.1,500 per station	30,000/-

	Water Quality Monitoring (12 Monitoring station) twice in during operation period at Intake well/Off take chamber, Sump & PH, Filtration Plant/WTP, ELSRs, Pipelines & Distribution network	24	Rs. 5,000 per station	1,00,000/-
III.	Compensatory plantation and three years maintenance (Compensatory afforestation ratio is 1:5)	150 nos plants & tree guards	Rs. 1000	1,50,000/-
IV.	Greenbelt development and maintenance in the surroundings / Buffer zone		Lump sum	5,00,000/-
V.	Miscellaneous			
	Health checkups and free medicine distribution		LS	2,00,000/-
	Awareness program/training		LS	1,50,000/-
	Noise barriers and PPEs for workers		LS	3,50,000/-
VI.	Sprinkling of water once in a day for two years (excluding rainy days): 500 days @ Rs.1000/trip		Rs. 1000 per day	5,00,000/-
	Sub Total			**23,93,000/-**
	GST@ 18%			**4,30,740/-**
	Grand Total			**28,23,740/-** **Say 28.25 lakhs**

The above items in the Environmental Management Plan shall be executed by the Contractor during project implementation.

5.5 Conclusion and Recommendations:

The potential impacts that are associated with design, construction, and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Based on the findings there are no significant impacts.

The project will generate direct employment opportunities to the local people of the area. As the project involves construction work it will offer opportunities for various skilled and non-skilled workers. The amount of money earned by the local people will directly affect the local economy

thereby reducing the chances of seasonal migrations of the local people. The project will provide short term direct employment benefits to the majority of the construction workers and even long term employment to few workers during the operation of the project. In order to augment such benefits, priority will be given to employ local laborers as far as possible.

The proposed project will bring about:

(i) The benefits of access to reliable supply of safe and potable water.

(ii) Promotion of good hygiene and sanitation practices and reduced health and safety risks as positive impacts.

(iii) Enhanced public health, improved quality of life and safe communities.

Recommendations are:

In order to sustain the availability of water, over extraction should be avoided especially in urban and rural areas and it should be used judiciously, otherwise the future generation will have to face crisis of water.

i. Micro-level rainwater harvesting culture should be adopted in every household.
ii. Water supply should be metered and monetized.
iii. The supply pipes need timely repair to reduce water leakage especially in urban areas.

Overall, the project will lead to enhanced public health and urban environment, significantly contributing to a qualitative improvement in the lives of Sullurpeta Municipality ULB residents.

CHAPTER- 6

DISCLOSURE OF CONSULTANT ENGAGED

The preparation of the Environment Impact Assessment and Environment Management Plan (EMP) was entrusted by APUFIDC to M/s. Aarvee Associates, Architects, Engineers & Consultants Pvt., Ltd., Hyderabad. The scope of AARVEE associates includes preparation of EIA & EMP report.

M/s. Aarvee Associates Architects Engineers and Consultants Pvt., Ltd., Hyderabad is **Re-Accredited with "A" grade by QCI-NABET** in their Vide AC. MoM dated 25th April 2019 for doing EIA and EMP Studies for five (6 sectors) including "River Valley, Mining, Thermal Power plants, Isolated storage and handling of hazardous chemicals, Industrial estates (SEZs, EPZs), Highways ".

The brief professional profile of M/s AARVEE Associates is given in the following section: Aarvee Associates is a premier, ISO 9001:2015 certified multi-disciplinary engineering consulting company, established in 1989 and based at Hyderabad in India. We have a pan-India presence, with branch offices in New Delhi, Ahmedabad and Bhubaneswar, and project offices in all the major states across the country. We also have a wholly owned Australian subsidiary, Aarvee Associates Pty Ltd, based at Brisbane, Queensland. In addition to over 1,000 successful assignments in India, we have carried out projects in Australia, Bangladesh, Ethiopia, Gabon, Mozambique, Nigeria, South Africa, Sri Lanka, and Uganda. We have worked on projects funded by various international agencies including the World Bank, the Asian Development Bank (ADB), the Department for International Development (DFID), and Japan International Cooperation Agency (JICA).

CHAPTER- 7

SOCIAL IMPACT ASSESSMENT

Based on the number of Project Affected Persons (PAPs) who may be affected by the project and magnitude of impact the projects have been categorized as S-1, S-2 or S-3 projects

i. S-1 projects are those that will affect 200 PAPs (30 – 40 Households) or more or if PAPs are physically displaced and will require a detailed Social Assessment Report (SAR) that would include a resettlement plan.
ii. S-2 projects are those in which no PAP is physically displaced and less than 10% of their productive assets are lost (or) less than 200 PAPs are affected. In this case a Social Management Plan (SMP) that would include an abbreviated resettlement plan can be submitted.
iii. S-3 projects, on the other hand will not have any households affected at all i.e. they can be classified as 'socially benign'. However, Social Status Report (SSR) can be submitted.

As per the proposals made for Providing Water Supply within the town there is no requirement for Land Acquisition. As per the guidelines the present project can be categorized under S-3 category as there is no PAP. The details are explained in Social Assessment Report.

Social Assessment

The proposal for provision of 24X7 Water Supply scheme designed to improve the standard of living of the people in Sullurpeta and the environmental and social policy is to promote environmentally sound, socially acceptable and economically viable urban infrastructure under Sullurpeta town.

The proposed scheme will ensure environmental soundness by conserving natural resources, preserving biodiversity and ecological equilibrium; and integrating mechanisms within projects to maintain and enhance environmental quality in Sullurpeta town.

The scheme shall address the Social reliability and acceptability by

i. Addressing legitimate concerns of relevant stakeholders, especially project affected persons.

ii. Avoiding or minimizing resettlement and rehabilitation due to land acquisition and transfer of government land under different tenure system through appropriate technical and management measures.

iii. Ensuring appropriate resettlement and rehabilitation of project affected persons Irrespective of legal status with a view to provide sustainable livelihood options that at least restore, if not improve, their standard of living.

iv. Protecting marginalized and vulnerable groups, including the economically and socially disadvantaged.

v. Minimizing health and safety hazards.

Public Disclosure and Development Options:

All the proposals will be presented in the presence of officials from line departments viz highways, water resources, electricity board and Municipality. The suggestions and comments will be received to modify the proposals if required for better drainage system within the town.

Development Option for minimizing the Impact:

From the design stage itself the alignment of proposed pipeline is selected in such a way that it will minimize land acquisition and R&R cost. Mostly the pipeline is proposed along the existing roads in government land.

Need for Resettlement and Rehabilitation:

All the components of the project are proposed on government owned lands and there is no private land acquisition in the project. The pipelines will be laid all along the roads, in the right of way.

In Sullurpeta town, it was found that there were no permanently impacted families losing land or structures. However, some structures are temporarily affected. Some mobile vendors are also affected. Hence in Sullurpeta town census survey and socio-economic survey of households, survey of temporarily affected structures and survey of mobile vendors affected were conducted. The outcomes of these surveys are presented in this section. There are no impacts on Community Property Resources (CPRs). The present project does not involve any displacement or adverse impacts on livelihood

Details of Temporarily Affected Structures

The survey found that there are 52 structures that are temporarily affected due to laying of pipelines spread over 4 locations in the town. In all 52 cases the expected impact is on access line. Of the 52 temporarily affected structures, 40 percent belonged to Kanchari Veedhi followed by around 29 percent of the structures to Bapuji Veedhi; 25 percent structures were affected in Gandla Street and the remaining around 6 percent of the structures belonged to Park Street (Table 7.1).

Table 7.1 Number and Distribution of Temporarily Affected Structures by Locations

S.No	Location	No	%
1	Bapuji Veedhi	15	28.8
2	Gandla Street	13	25.0
3	Kanchari Vedhi	21	40.4
4	Park Sreet	3	5.8
Total		52	100.0

With regard to ownership of temporarily affected structures it was found that all of them belonged to the category of encroachments (table 7.2).

Table 7.2 Ownership Details of Temporarily Affected Structures

S.No	Ownership	No	%
1	Encroachments	52	100.0
	Total	52	100.0

The survey data has shown that, of the 52 temporarily affected structures, 44 percent were ramps and 40 percent were stairs and remaining 15 percent were platforms (Table 7.3).

Table 7.3 Type of Affected Structures

S.No	Type of structure	No	%
1	Ramps*	23	44.2
2	Stair**	21	40.4
3	Platform***	08	15.4
	Total	52	100.0

* (a sloping surface joining entrance with road, or a platform)
** (a set of steps leading from main entrance of the residential / commercial structure to road)
*** a raised level surface on which people or things can stand

i. All these structures are found to be semi-pucca structures.

ii. The data on type of usage of affected structure indicated that around 89 percent of structures are used for commercial purpose and 11.5 percent belonged to residential usage (Table 7.4).

Table 7.4 Type of usage of affected structure

S.No	Usage	No	%
1	Residential	6	11.5
2	Commercial	46	88.5
	Total	52	100.0

With reference to the usage of Residential affected structures (including stairs and ramps), it is observed that they were used for accessing road, sitting and vehicle parking. Similarly, with reference to the usage of Commercial structures (including stairs and ramps), it is observed that they were used for accessing road, keeping items for display and for parking vehicles.

iii. With regard to number of area of the structures affected, it was found that among the 52 affected structures, majority of 23 are ramps while 21 structures are used as stairs and only 8 structures are used as platforms (Table 7.5).

Table 7.5 Number of Area of Affected structures under Usage Category

S.No.	Location	Ramps	Stair	Platform	Total
1	Bapuji Veedhi	4	9	2	15
2	Gandla Street	4	6	3	13
3	Kanchari Veedhi	14	6	1	21
4	Park Street	1	0	2	3
	Total	23	21	8	52

With regard to the area of the structures affected, it was found that total area affected is 98.5 square meters, of which 48 square meters of stairs, 34 square meters of as ramps and remaining 16.5 square meters are used as platforms (Table 7.6).

Table 7.6 Area of affected structures under usage category (square meters)

S.No	Location	Ramps	Stair	Platform	Total
1	Bapuji Veedhi	7.0	23.0	2.0	32.0
2	Gandla Street	6.50	14.0	11.0	31.50
3	Kanchari Veedhi	19.50	11.0	1.50	32.0
4	Park Street	1.0	--	2.0	3.0
	Total	34.0	48.0	16.50	98.50

The data on social status of the families owning temporarily affected structures showed that 48 percent belonged to Backward Caste Category and 23 percent belonged to Scheduled Tribe Category who are mainstreamed; 17 percent belonged to Other Castes and the remaining about 11 percent belonged to Scheduled Caste category (Table 7.7).

Table 7.7 Social Groups

S.No	Vulnerability	No	%
1	SC	6	11.5
2	ST (Mainstreamed)	12	23.1
3	BC	25	48.1
4	OC	9	17.3
	Total	52	100.0

When enquired about the preference for compensation of temporarily affected structure, all 52 PAPs constituting 100 percent preferred cash compensation (Table 7.8).

Table 7.8 Preference for Compensation

S.No.	Preference	No	%
1	Cash	52	100.0
	Total	52	100.0

Around 75 percent of temporarily affected families suggested completing the work fast while remaining around 25 percent suggested for changing line (Table 7.9). However, it is observed that , technically it is not viable and impact would have been more if the construction of the project shifted to the other side.

Table 7.9 Suggestions of Temporarily Affected Families

S.No.	Suggestion	No	%
1	Change Line	13	25.0
2	Complete fast	39	75.0
	Total	52	100.0

Details of Mobile Vendors Affected

The survey has found that 25 mobile vendors are affected in the entire town due to the water supply project, out of which 52 percent were females and 44 percent were males while 1 vendor

was not available (Table 7.10). The activities of mobile vendors include selling of bangles, flowers, fruits, tea, biscuits, vegetables and petty shop.

Table 7.10 Gender composition

S.No	Gender	No	%
1	Male	11	44.0
2	Female	13	52.0
3	Not available	1	4.0
	Total	25	100.0

The data on religion indicates that, 76 percent were Hindus and 20 percent were Muslims (Table 7.11).

Table 7.11 Religion

S.No	Religion	No	%
1	Hindu	19	76.0
2	Muslim	5	20.0
3	NA	1	4.0
	Total	25	100.0

The social groups of these vendors include 52 percent belong to BC category and 40 percent belong to SCs and remaining 4 percent belong to STs who are mainstreamed (Table 7.12).

Table 7.12 Social Group

S.No	Social Group	No	%
1	SC	10	40.0
2	ST (Mainstreamed)	1	4.0
3	BC	13	52.0
4	Other Caste	1	4.0
	Total	25	100.0

CHAPTER- 8

PUBLIC CONSULTATION/DISCLOSURE

The main purpose of the Public Consultation/Disclosure process is to reveal the Environmental impacts at ULB level due to the proposed project APUWS&SMIP. The Public consultation was organized digitally (during the period of Covid-19 pandemic scenario) as suggested by AIIB, from 15.07.2020 to 29.07.2020 at all 21 ULB's at Commissioner Offices and PHMED offices concerned. The whole process was conducted by PHMED with technical assistance from PMC, as for the bank norms and suggestions made during the process. Necessary precautions were taken to capture the opinions/feedbacks from the wide range of stakeholders and other populations.

whatsapp group discussions were also invited on the Environmental Impact Assessment and Environmental management Plan reports. Feedback forms were collected respective stakeholders. Also attached **Annexure -IV**

Public Consultation Outcomes:

The following are the some of the key findings/observations during the process is placed in Table 8.1

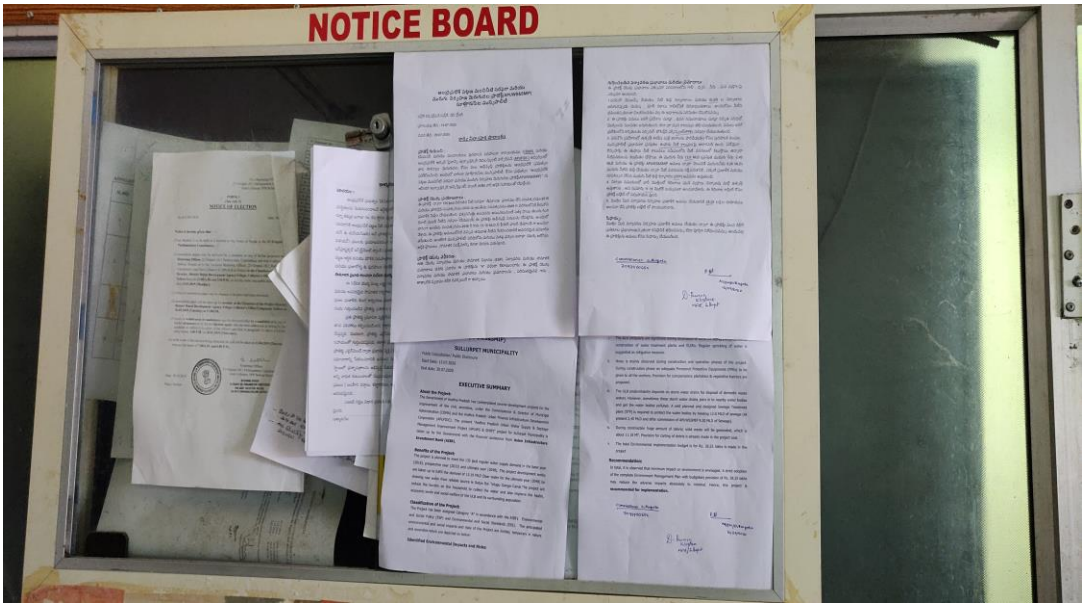
Table 8.1 Public consultation feedback questions and Answers

S.No	Stake Holders Questions Raised	Answers
1	During construction huge amount of debris/ solid waste will be generated, How those wastes manage?	i. Top priority will be given to reuse the debris/ solid waste material in the project i.e., development of existing service roads, development of landscaping in the available ULB lands. ii. Temporary drainage facilities will be provided, and solid waste collection and disposal facilities will be provided at the construction site.
2	The construction related activities that generates dust, noise and impede access could disturb the local residents. It may also create traffic problems due to traffic jams near the	i. The local residents will be consulted and informed about the disturbances in advance. ii. Temporary diversions and signboards will

S.No	Stake Holders Questions Raised	Answers
	construction site?	be provided for the pedestrians. iii. Traffic management will be done to mitigate the impacts.
3	While project Implementation time ambient noise levels are generated at ELSR's and Construction sites how to control it?	i. Noise is mainly observed during construction and operation phases of the project. During construction phase an adequate Personnel Protective Equipments (PPEs) to be given to all the workers, Provision for compensatory plantation & vegetative barriers are proposed. ii. Use of less noise generating equipment for all activities, provision for personal protective equipment, earmuffs, etc. for construction laborers.
4	This Water Supply Project will Disturb the Biological Environment & Degradation of Cultivated Land and Vegetation can you Please Explain?	i. Compensatory plantation and three years maintenance (Compensatory afforestation ratio is 1:5) ii. It is proposed to plant each removal plant to plant a 5 trees in the project which works out to be more than the stipulated norms. These plants will be planted at the empty areas around ELSR, GLBR and WTP areas.

The public Consultation Executive Summaries English/Telugu displayed Notice Boards at SE/EE/DE/Commissioner office. The displayed notice board is placed below as Figure No 8.1.

Figure 8. 1 Displayed Notice Boards at SE/EE/DE/Commissioner Offices



ANNEXURE-I

GOVERNMENT OF ANDHRA PRADESH
ABSTRACT

Water Resources Department-Water supply Scheme with the assistance of Asian Infrastructure Investment Bank (AIIB) under EAP- Water drawl Permission – Orders - Issued.

- -

WATER RESOURCES (WRG-GRC) DEPARTMENT

G.O.RT.No. 485 Dated: 22-09-2020.

Read the following:-

1) G.O.Ms.No.37, Irrigation & CAD (PW:EA) Department, Dated:21.02.2009.
2) From the Engineer-in-Chief (Public Health), Guntur, E-office proposals for Water Drawl permission in 21 ULBs.
3) From the Engineer-in-Chief (Irr), Water Resources Department, Vijayawada, Lr.No.ENC(I)/EE/DEE2/AEE5/APUWSSMIP/2020, dated:08.06.2020.

@@@

ORDER:

The Municipal Administration & Urban Development Department has forwarded the proposals of the Engineer-in-Chief (Public Health), Guntur and informed that Comprehensive Project proposal relating to Andhra Pradesh Urban Water Supply & Septage Management Improvement Project (APUWSSMIP) under Externally Aided Project (EAP) with financial Assistance from Asian Infrastructure Investment Bank (AIIB) for Rs.5050.17 Crores had been formulated with an objective to provide infrastructure facilities in 50 Urban Local Bodies of the State and requested the Water Resources Department to issue permission for drawl of raw water in 21 Urban Local Bodies for water supply schemes from the various Sources/reservoirs. The proposals sent to ENC (Irr) for detailed feasibility report.

2. The Engineer-in-Chief (Irr), Water Resources Department, Vijayawada, has furnished the feasibility report (received from the Chief Engineers) on the proposals of ENC (PH), Guntur for drawl of water in 21 ULBs for water supply schemes with the assistance of AIIB under EAP from the Source/reservoirs.

3. Government, after careful examination of the report of ENC (Irr), Vijayawada and taking into consideration drinking water is the first priority as per State Water Policy, hereby agreed the proposals of ENC (PH) in principle and accord permission for drawl total quantity of 4.482 TMC raw water to the following 21 Urban Local Bodies (ULBs) from various Sources/reservoirs to facilitate drinking water supply schemes with the assistance of AIIB under EAP, subject to the Urban Local Bodies (ULBs) submit their designs and drawings of works for drawls to the Chief Engineer concerned, on submission of designs and drawings, the Chief Engineer will approve the designs and drawings in consultation with Chief Engineer, CDO (if required) and issue necessary permission expeditiously.

Sl.No.	District	Name of the ULB	Name of the Source	Requirement Quantity in TMC
1.	Srikakulam	1.Palasa	Regulapadu Off shore, Mahendratanaya River	0.108
2.	Visakhapatnam	2. Narsipatnam	Yeleru Canal	0.30
3.	East Godavari	3. Gollaprolu	Yeleru Reservoir	0.09
		4. Mummidivaram	Pallamkurru Canal near Mummidivaram	0.08
4.	Krishna	5.Thiruvuru	River Krishna at Ferry, Ibrahimpatnam	0.10
		6.Nandigama	River Krishna at Gudimetla	0.14
		7. Vuyyuru	Pulleru canal at Yakamuru village During canal closure	0.10

			period	
5.	Guntur	8. Macherla	Buggavagu	0.23
		9.Piduguralla	Buggavagu	0.28
		10.Vinukonda	Jawahar Right Main Canal near Vellatur Village at Ch:126.196 KM	0.23
		11. Mangalagiri	Krishna River	0.31
		12. Tadepalli	Krishna River	0.27
6.	Prakasam	13. Chimakurthy	Ramatheertham Balancing Reservoir	0.148
		14. Giddalur	Gundla Bramheswaram Reservoir	0.17
		15. Kanigiri	Ramatheertham Balancing Reservoir	0.135
7.	Nellore	16. Naidupet	KP Canal	0.22
		17. Sullurpata	KP Canal	0.25
8.	Ananthapuramu	18. Madakasira	Akkampalli Cheruvu	0.081
		19. Kalyanadurgam	Penna Ahobilam Balancing Reservoir (PABR) TBPHLC	0.15
		20. Puttaparthy	Bukkapatnam Cheruvu	0.71
9.	Kurnool	21. Yemmiganur	TBPLLC	0.38
			Gajuladinne Project	
Grand Total				**4.482 TMC**

4. The Chief Engineer concerned and Chief Engineer, CDO would take necessary action expeditiously for giving approval of design only as water allocation is ordered as per this order.

5. The Engineer-in-Chief (Irr), Water Resources Department, Vijayawada shall take necessary further action.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

ADITYA NATH DAS
Special Chief Secretary to Government

To
The Engineer-in-Chief (Irr), Water Resources Department, Vijayawada.
The Engineer-in-Chief (Public Health), Guntur.
Copyto:
All Chief Engineers concerned
The Chief Engineer, CDO, Water Resources Department
The PS to Additional Secretary to Chief Minister, Andhra Pradesh.
The Municipal Administration & Urban Development Department.
The P.S. to Hon'ble Minister for Water Resources Department.
The P.S. to Special Chief Secretary to Government, Water Resources Department.
SC/SF.

//FORWARDED :: BY ORDER//

SECTION OFFICER

ANNEXURE-II

GOVERNMENT OF ANDHRA PRADESH
WATER RESOURCES DEPARTMENT

From
Sri M.Subramanyam, M.Tech,
Executive Engineer,
NTR TGP Division,
Srikalahasti

To
The Superintending Engineer,
TGP & GNSS Circle,
Tirupati.

Lr.No.EE/ NTR TGP.Divn/SKHT/ AEE(T)/ W.R. File/ 188 SE Dt:23/07/2020.

Sir,

Sub:- Andhra Pradesh Urban Water Supply and Sepatge Management Improvement Project (APUWSSMIP)- Water Supply Improvement Schemes including operation and maintenance in muinicipal towns of sullurpeta & Naidupeta in SPSR Nellore District, Chittoor & Puttur in Chittoor District, Addanki, Kangiri, Chimakurthy & Giddaluru in Prakasam District of Public Health Circle, Nellore (Package-I) with Asian Infrastructure Investment Bank (AIIB) funding – Hydraulic particulars of Kandaleru reservoir and canal flow particulars of SSG Canal- Submitted -Reg.

Ref:-1)The Superintending Engineer, Public Health, Nellore Lr.No.,01/NLR-CLUSTER/ PUTTUR/ AIIB/ WSIS/ P-1/DB/ATO/2019, Dt: 25-06-2020 communicated vide Superintending Engineer, TGP& GNSS Circle, Tirupati office Endt No.SE/TGP & GNSSC/TPT/AEE3/ Drinking water file/168 SKHT, Dt: 25.07.2020.

***

With reference to the Superintending Engineer's endorsement cited, I here with enclose the canal flow particulars of SSG Canal during the periods from 2016 to 2020.

Encl:- Water guage reading statements.

Yours faithfully,

Executive Engineer,
NTR TGP Division,Srikalahasti.

Copy submitted to the Superintending Engineer, Public Health, Nellore for information and necessary action.

27/7/2020

Executive Engineer,
NTR TGP Division,Srikalahasti.

Water Gauge Readings

Sl. No.	Date	KM 69.375	KM 82.016	KM 95.700	KM 107.200	KM 125.000	Flume
		Discharge	Discharge	Discharge	Discharge	Discharge	Discharge
	10.10.2016.						
	11.10.2016.						
	12.10.2016.						
	13.10.2016.						
	14.10.2016.						
	15.10.2016.	167					
	16.10.2016.	457	432	314	150		
	17.10.2016.	487	468	341	343		
	18.10.2016.	513	468	375	343	223	
	19.10.2016.	530	519	390	350	342	15.41
	20.10.2016.	589	577	406	380	357	80.09
	21.10.2016.	728	712	505	472	395	103.64
	22.10.2016.	825	795	646	600	507	165.9
	23.10.2016.	885	860	746	712	625	240.83
	24.10.2016.	891	864	729	715	633	332.54
	25.10.2016.	845	795	636	625	551	328.53
	26.10.2016.	835	783	581	555	503	297.00
	27.10.2016.	828	774	551	534	479	251.75
	28.10.2016.	828	774	514	491	406	255.43
	29.10.2016.	819	774	514	491	406	259.12
	30.10.2016.	823	744	466	393	296	240.83
	31.10.2016.	968	907	596	479	406	129.13
	01.11.2016.	1042	979	759	680	305	205.63
	02.11.2016.	954	906	768	741	422	251.75
	03.11.2016.	784	743	471	453	446.72	274.07
	04.11.2016	681	638	452	420	300.37	209.06
	05.11.2016	531	476	294	265	283.93	165.9
	06.11.2016	420	376	197	178	115.94	72.7
	07.11.2016	225	195	149	125	57.3	28.32
	Total(cusecs)	**16655**	**15559**	**11400**	**10495**	**8060.26**	**3907.63**
	Mcft	**1438.992**	**1344.2976**	**984.96**	**906.768**	**696.406464**	**337.619232**

27/7/2024
DEPUTY EXECUTIVE ENGINEER
NTR T.G.P. SUB DIVISION
B.N. KANDRIGA.

27/7
EXECUTIVE ENGINEER
TELUGU GANGA PROJECT DIVISION
SRIKALAHASTI

Water Gauge Readings 6 A.M

Sl.No.	Date	KM 69.375	KM 85.050	KM 95.700	KM 107.200	KM 125.000	Flume @ KM 151.700
		Discharge	Discharge	Discharge	Discharge	Discharge	Discharge
1	12.11.2016	187	99	190	-	-	-
2	13.11.2016	571	518	130	228	-	-
3	14.11.2016.	531	480	266	103	-	-
4	15.11.2016	487	408	263	232	129	-
5	16.11.2016	487	414	219	203	124	23.18
6	17.11.2016	442	275	252	178	80	18.39
7	18.11.2016	432	364	278	203	104	15.41
8	19.11.2016	460	364	231	178	96	6.5
9	20.11.2016	409	324	188	173	96	1.93
10	21.11.2016	409	328	208	138	67	-
11	22.11.2016	383	304	206	192	67	-
12	23.11.2016	423	322	232	194	67	-
13	24.11.2016	492	402	530	178	67	-
14	25.11.2016.	690	646	530	340	104	-
15	26.11.2016.	928	823	785	652	472	65.5
16	27.11.2016.	953	832	753	697	580	293.14
17	28.11.2016.	906	790	717	734	673	374
18	29.11.2016	836	687	637	635	607	399
19	30.11.2016	908	760	670	635	617	357
20	01.12.2016	1014	764	675	665	633	408
21	02.12.2016	1068	877	852	825	709	408
22	03.12.2016	1022	840	810	796	726	429
23	04.12.2016	1023	852	849	853	775	465
24	05.12.2016	1122	892	818	759	726	492
25	06.12.2016	1068	870	825	804	727	456
26	07.12.2016	1113	898	849	811	773	487
27	08.12.2016	1006	759	700	762	773	515
28	09.12.2016	975	720	662	689	747	510
29	10.12.2016	1019	800	712	654	642	451
30	11.12.2016	1005	834	765	678	699	451
31	12.12.2016	486	420	434	532	467	411
32	13.12.2016	217	193	248	262	413	282
	Total	**23072**	**18859**	**16484**	**14983**	**12755**	**7319.05**
	Mcft	**1993.42**	**1629.42**	**1424.22**	**1294.53**	**1102.03**	**632.37**

Water Gauge Readings

Sl.No.	Date	KM 67.500	KM 69.375	KM 85.050	KM 95.700	KM 107.20	KM 125.000	Flume @ KM 151.700
		Discharge	Discharge	Discharge	Discharge	Discharge	Discharge	Discharge
1	11.01.2017	450	440	271	176	0	0	0
2	12.01.2017	475	465	304	212	160	0	0
3	13.01.2017	522	414	267	186	138	51	0
4	14.01.2017	485	399	238	176	103	22	0
5	15.01.2017	622	490	303	192	138	22	0
6	16.01.2017	661	546	371	223	160	22	0
7	17.01.2017	744	502	363	244	178	56	7.62
8	18.01.2017	870	681	423	268	233	78	2.69
9	19.01.2017	1010	847	526	377	305	50	1.93
10	20.01.2017	999	700	509	392	378	170	11.29
11	21.01.2017	1045	885	709	512	391	171	112
12	22.01.2017	893	863	692	530	431	206	118
13	23.01.2017	981	950	712	628	499	327	178
14	24.01.2017	985	955	759	624	501	408	206
15	25.01.2017	1145	1081	855	680	652	540	248
16	26.01.2017	1128	1046	868	699	601	470	309
17	27.01.2017	1136	1041	823	703	552	532	325
18	28.01.2017	1151	1064	945	881	757	629	329
19	29.01.2017	1163	1059	944	867	790	664	442
20	30.01.2017	1125	1041	899	812	780	713	460
21	31.01.2017	1093	1033	855	689	594	680	447
22	01.02.2017	1044	992	862	777	724	648	425
23	02.02.2017	1073	1022	862	771	704	586	425
24	03.02.2017	945	899	749	706	685	674	442
25	04.02.2017	1069	1010	862	778	753	649	425
26	05.02.2017	1029	992	841	825	729	649	451
27	06.02.2017	961	920	793	745	729	649	434
28	07.02.2017	895	863	762	674	692	649	416
29	08.02.2017	784	728	637	609	588	540	399
30	09.02.2017	815	764	631	538	509	489	369
31	10.02.2017	874	821	664	513	497	427	325
32	11.02.2017	940	890	772	627	585	506	333
33	12.02.2017	914	863	785	619	604	489	349
34	13.02.2017	950	886	699	562	538	506	349
35	14.02.2017	1036	966	841	775	667	569	345
36	15.02.2017	1036	966	845	749	684	583	403
37	16.02.2017	1011	821	793	688	711	693	469
38	17.02.2017	988	802	760	749	677	693	483
39	18.02.2017	972	780	748	688	638	665	492
40	19.02.2017	915	724	695	596	560	583	442
41	20.02.2017	864	680	677	634	562	512	399
42	21.02.2017	831	644	631	602	550	512	357

Water Gauge Readings 2017

Sl.No.	Date	KM 67.500	KM 85.050	KM 107.200	KM 125.000	Flume
		Discharge	Discharge	Discharge	Discharge	Discharge
	06-12-2017	392.00	-	-	-	-
	07-12-2017	407.00	256	150	-	-
	08-12-2017	370.00	206	150	-	-
	09-12-2017	281.00	166	126	-	-
	10-12-2017	87.00	-	-	-	-
	11-12-2017	87.00	-	-	-	-
	12-12-2017	71.00	-	-	-	-
	13-12-2017	64.00	-	-	-	-
	14-12-2017	87.00	-	-	-	-
	15-12-2017	298.00	-	-	-	-
	16-12-2017	137.00	-	-	-	-
	17-12-2017	186.00	-	-	-	-
	18-12-2017	244.00	-	-	-	-
	19-12-2017	155.00	-	-	-	-
	20-12-2017	154.00	-	-	-	-
	21-12-2017	136.00	-	-	-	-
	22-12-2017	85.00	-	-	-	-
	23-12-2017	216.00	154	-	-	-
	24-12-2017	122.00	47	-	-	-
	25-12-2017	126.00	47	-	-	-
	26-12-2017	130.00	40	-	-	-
	27-12-2017	180.00	108	-	-	-
	28-12-2017	773.00	346	70	-	-
	29-12-2017	841.00	398	200		
	30-12-2017	890.00	481	230	60	
	31-12-2017	773.00	388	303	91	
	01-01-2018	889.00	545	333	228	12.62
	02-01-2018	838.00	573	476	310	45.65
	03-01-2018	966.00	668	574	357	90.31
	04-01-2018	1001.00	678	578	388	129.13
	05-01-2018	983.00	732	640	406	126.21
	06-01-2018	1021.00	772	661	445	215.99
	07-01-2018	1059.00	756	502	402	270.30
	08-01-2018	1029.00	743	601	449	248.09
	09-01-2018	993.00	732	572	432	255.43
	10-01-2018	996.00	772	580	432	237.23
	11-01-2018	996.00	806	613	504	251.75
	12-01-2018	1064.00	772	643	504	274.02
	13-01-2018	1054.00	828	656	551	289.29
	14-01-2018	1019.00	800	634	565	308.7
	15-01-2018	1008.00	772	626	551	320.55
	16-01-2018	1007.00	792	597	504	312.63
	17-01-2018	985.00	772	639	504	312.63
	18-01-2018	1037.00	820	601	513	308.7
	19-01-2018	1037.00	820	601	477	308.7
	20-01-2018	920.00	720	613	551	312.63
	21-01-2018	993.00	770	601	513	316.58
	22-01-2018	1044.00	770	613	513	304.79
	23-01-2018	1056.00	820	646	534	316.58
	24-01-2018	1212.00	954	753	610	320.55

Water Gauge Readings 2018						
Sl.No.	Date	KM 67.500	KM 85.050	KM 107.200	KM 125.000	Flume
		Discharge	Discharge	Discharge	Discharge	Discharge
	01-02-2018	1200.00	970	729	591	390.42
	02-02-2018	1184.00	892	739	631	407.52
	03-02-2018	1200.00	970	758	591	403.22
	04-02-2018	1141.00	908	780	692	420.50
	05-02-2018	1090.00	877	716	634	429.23
	06-02-2018	1167.00	936	825	706	433.62
	07-02-2018	1077.00	847	794	706	464.74
	08-02-2018	1067.00	853	774	634	446.87
	09-02-2018	1036.00	853	774	682	442.44
	10-02-2018	986.00	772	716	662	438.02
	11-02-2018	942.00	732	646	591	407.52
	12-02-2018	955.00	738	613	513	373.57
	13-02-2018	1085.00	853	638	551	356.97
	14-02-2018	1079.00	877	716	631	398.94
	15-02-2018	1098.00	877	691	631	420.5
	16-02-2018	1122.00	908	758	648	424.86
	17-02-2018	1189.00	970	845	677	438.02
	18-02-2018	1241.00	1091	956	783	501.19
	19-02-2018	1235.00	1086	963	860	557.54
	20-02-2018	1241.00	1112	997	860	601.1
	21-02-2018	1148.00	1022	941	860	601.1
	22-02-2018	1071.00	970	866	754	552.77
	23-02-2018	1018.00	939	817	748	533.81
	24-02-2018	1094.00	1031	847	748	533.81
	25-02-2018	1102.00	1022	867	769	552.77
	26-02-2018	968.00	862	714	748	557.54
	27-02-2018	916.00	839	705	701	505.80
	28-02-2018	855.00	777	696	701	505.80
	Total (Cusecs)	**30507.00**	**25584.00**	**21881.00**	**19303.00**	**13100.19**
	Mcft	**2635.80**	**2210.46**	**1890.52**	**1667.78**	**1131.86**

27/2/2020

DEPUTY EXECUTIVE ENGINEER
NTR T.G.P. SUB DIVISION
B.N. KANDRIGA.

Water Gauge Readings 2018 6 A.M						
Sl.No.	Date	KM 67.500	KM 85.050	KM 107.200	KM 125.000	Flume
		Discharge	Discharge	Discharge	Discharge	Discharge
	01-03-2018	744.00	668	607	610	487.41
	02-03-2018	820.00	651	582	581	455.78
	03-03-2018	762.00	668	618	550	416.16
	04-03-2018	710.00	653	575	550	416.16
	05-03-2018	618.00	545	454	486	381.97
	06-03-2018	609.00	555	423	404	297
	07-03-2018	557.00	509	413	367	262.83
	08-03-2018	577.00	525	388	367	226.53
	09-03-2018	577.00	525	413	367	219.49
	10-03-2018	527.00	467	360	301	209.06
	11-03-2018	459.00	402	280	220	159.56
	12-03-2018	417.00	394	280	220	106.38
	13-03-2018	417.00	394.00	255	247	144.08
	14-03-2018	379.00	355	295	237	126.21
	15-03-2018	343.00	314	276	282	141.05
	16-03-2018	328.00	302	260	247	141.05
	17-03-2018	295.00	268	261	247	135.05
	18-03-2018	251.00	235	217	236	138.04
	19-03-2018	262.00	246	216	181	80.09
	20-03-2018	262.00	246	220	205	87.71
	21-03-2018	232.00	216	170	140	72.70
	22-03-2018	241.00	225	142	131	98.23
	23-03-2018	241.00	225	144	123	35.68
	24-03-2018	81.00	70	124	103	52.02
	25-03-2018					31.93
	26-03-2018					6.500
	Total (Cusecs)	**10709.00**	**9658.00**	**7973.00**	**7402.00**	**4928.67**
	Mcft	**925.26**	**834.45**	**688.87**	**639.53**	**425.84**

27/7/2018

DEPUTY EXECUTIVE ENGINEER
NTR T.G.P. SUB DIVISION
B.N. KANDRIGA.

Water Gauge Readings 2018						
Sl.No.	Date	KM 67.500	KM 84.350	KM 107.200	KM 125.000	Flume
		Discharge	Discharge	Discharge	Discharge	Discharge
1	26-09-2018	245	227			
2	27-09-2018	417	279			
3	28-09-2018	893.00	854	516	404	39.57
	29-09-2018	1054.00	1017	885	784	352.80
	30-09-2018	1090.00	1042	905	863	581.6
	01-10-2018	1030.00	992	877	863	665.90
	02-10-2018	921.00	892	711	784.5	620.8
	03-10-2018	1012.00	983	872	834	615.86
	04-10-2018	1012.00	988	892	851	686.29
	05-10-2018	1065.00	1052	940	898	727.67
	06-10-2018	1065.00	1052	949	898	717.25
	07-10-2018	1046.00	1017	898	868	706.88
	08-10-2018	1046.00	1022	892	851	691.42
	09-10-2018	1032.00	1007	906	868	717.25
	10-10-2018	1032.00	1002	892	851	722.46
	11-10-2018	1032.00	1007	906	852	701.72
	12-10-2018	1032.00	1007	833	746	706.88
	13-10-2018	1051.00	1022	913	834	630.74
	14-10-2018	1032.00	1007	892	852	722.46
	15-10-2018	1051.00	1022	906	868	722.46
	16-10-2018	985.00	949.00	833	770	722.46
	17-10-2018	944.00	895.00	749	675	645.73
	18-10-2018	985.00	944.00	749	689	640.72
	19-10-2018	985.00	944.00	739	689	601.1
	20-10-2018	885.00	845.00	686	621	581.6
	21-10-2018	985.00	912.00	721	621	562.32
	22-10-2018	1012.00	969.00	749	665	596.2
	23-10-2018	944.00	907.00	771	669	620.8
	24-10-2018	1022.00	963.00	791	665	596.20
	25-10-2018	1015.00	963.00	680	582	591.32
	26-10-2018	989.00	916.00	721	706	548.01
	27-10-2018	619.00	562.00	546	480	501.19
	28-10-2018	241.00				230.08
	29-10-2018	197.00				56.41
	30-10-2018					
	Total (Cusecs)	**30966.00**	**29260.00**	**24320.00**	**22601.50**	**18824.15**
	Mcft	**2675.46**	**2528.06**	**2101.25**	**1952.77**	**1626.41**

27/7/2020

DEPUTY EXECUTIVE ENGINEER
NTR T.G.P. SUB DIVISION
B.N. KANDRIGA.

Water Gauge Readings 2019							
Sl.No.	Date	KM 67.500	KM 84.350	KM 95.700	KM 107.200	KM 125.000	Flume
		Discharge	Discharge	Discharge	Discharge	Discharge	Discharge
	06-02-2019	378	169	0	0	0	0
	07-02-2019	601	319	196	0	0	0
3	08-02-2019	843.00	561	438	310	0	0
4	09-02-2019	1008.00	674	552	330	0	0
5	10-02-2019	1100.00	763	655	409	150	10.01
6	11-02-2019	1102.00	738.00	630.00	359.00	123.00	39.57
7	12-02-2019	1217.00	904.00	639.00	438.00	145.00	41.57
8	13-02-2019	1297.00	1014.00	728	623	262	98.23
9	14-02-2019	1323.00	1041.00	887	655	436	188.73
10	15-02-2019	1324.00	1168.00	984	834	668	340.62
11	16-02-2019	1206.00	1036.00	923	790	748	420.5
12	17-02-2019	1206.00	1005.00	914	766	668	381.97
13	18-02-2019	1206.00	1050	875	780	668	394.67
14	19-02-2019	1065.00	866	736	723	729	424.86
15	20-02-2019	1002.00	791.00	653	602	572	377.76
16	21-02-2019	964.00	723	577	602	548	324.53
17	22-02-2019	880.00	668	570	573	513	316.58
18	23-02-2019	856.00	668	552	478	432	251.75
19	24-02-2019	809.00	662	517	438	380	248.09
20	25-02-2019	562.00	440	331	361	327	195.43
21	26-02-2019	470.00	379	256	265	250	129.13
22	27-02-2019	407.00	333	215	210	189	153.31
23	28-02-2019	290.00	269	215	190	150	85.15
24	01-03-2019	261.00	230	175	153	150	45.65
25	02-03-2019	185.00		0	0	0	10.01
	Total (Cusecs)	**21562.00**	**16471.00**	**13218.00**	**10889.00**	**8108.00**	**4478.12**
	Mcft	**1862.96**	**1423.09**	**1142.04**	**940.81**	**700.53**	**386.91**

27/2/2020

DEPUTY EXECUTIVE ENGINEER
NTR T.G.P. SUB DIVISION
B.N. KANDRIGA.

Water Gauge Readings 2019 6 A.M							
Sl.No.	Date	KM 67.500	KM 84.350	KM 107.200	KM 125.000	Flume	Flume Cummulative
		Discharge	Discharge	Discharge	Discharge	Discharge	
1	27-09-2019	880	641	219			
2	28-09-2019	1469	1368	955	689		
3	29-09-2019	1380	1283	1155	1136	630	
4	30-09-2019	1408	1377	1256	1215	785.87	
5	01-10-2019	1419	1379	1255	1187	812.81	
6	02-10-2019	1346	1365	1228	1142	834.29	
7	03-10-2019	1012	983	851	1082	802	
8	04-10-2019	1036	986	846	989	722.46	
9	05-10-2019	1121	1081	894	868	676.08	
10	06-10-2019	1145	1102	971	920	706.88	
11	07-10-2019	1150	1112	971	920	712.06	
12	08-10-2019	1093	1051	929	885	706.88	
13	09-10-2019	1097	1056	929	885	717.25	
14	10-10-2019	984	946	835	885	706.88	
15	11-10-2019	1067	1023	866	801	655.80	
16	12-10-2019	1108	1066	901	801	610.92	
17	13-10-2019	1053	930	699	616	615.86	
18	14-10-2019	1126	1081	813	705	424.86	
19	15-10-2019	1137	1097	920	817	601.10	
20	16-10-2019	1147	1101	979	851	706.88	
21	17-10-2019	1182	1143	998	881	706.88	
22	18-10-2019	1182	1142	1010	887	722.46	
23	19-10-2019	1118	1066	931	851	706.88	
24	20-10-2019	1142	1076	977	851	691.42	
25	21-10-2019	1147	1092	970	867	701.71	
26	22-10-2019	1127	1077	956	885	785.87	
27	23-10-2019	1147	1101	979	911	775.18	
28	24-10-2019	1142	1096	971	911	785.87	
29	25-10-2019	1249	1205	1058	939	780.52	
30	26-10-2019	1197	1149	1023	952	802.00	
31	27-10-2019	1156	1106	994	938	775.18	
32	28-10-2019	1159	1107	968	876	727.67	
33	29-10-2019	1104	1004	794	815	665.91	
34	30-10-2019	924	819	705	720	630.74	
35	31-10-2019	1043	939	794	693	576.76	
	Total (Cusecs)	40197.00	38150.00	32600.00	30371.00	23263.93	0.00
	Mcft	3473.02	3296.16	2816.64	2624.05	2010.00	0.000

DEPUTY EXECUTIVE ENGINEER
NTR T.G.P. SUB DIVISION
B.N. KANDRICA.

Water Gauge Readings 2019 6 A.M							
Sl.No.	Date	KM 67.500	KM 84.350	KM 107.200	KM 125.000	Flume	Flume Cummulative
		Discharge	Discharge	Discharge	Discharge	Discharge	
1	27-09-2019 to 31-10-2019	40197	38150	32600	30371	23263.93	
2	01-11-2019	933	848	734	681	567.12	
3	02-11-2019	802	707	602	635	538.53	
4	03-11-2019	813	706	483	512	411.83	
5	04-11-2019	892	639	483	418	332.54	
6	05-11-2019	884	591	440	383	300.89	
7	06-11-2019	939	632	475	318	244.45	
8	07-11-2019	1157	706	495	339	182.11	
9	08-11-2019	1226	754	556	373	182.11	
10	09-11-2019	1226	740	556	353	185.41	
11	10-11-2019	1213	719	591	342	175.57	
12	11-11-2019	1214	713	591	342	175.57	
13	12-11-2019	1101	586	591	342	172.33	
14	13-11-2019	1094	522	431	299	165.90	
15	14-11-2019	1042	452	352	286	153.31	
16	15-11-2019	1104	522	332	250	129.13	
17	16-11-2019	1168	651	332	250	126.21	
18	17-11-2019	1088	666	332	250	132.08	
19	18-11-2019	1071	637	400	200	95.57	
20	19-11-2019	1050	622	400	149	56.41	
21	20-11-2019	975	577	400	149	56.41	
22	21-11-2019	1002	591	360	176	82.00	
23	22-11-2019	1024	577	360	259	135.05	
24	23-11-2019	1039	578	360	227	109.14	
25	24-11-2019	975	500	400	149	56.41	
26	25-11-2019	933	487	360	149	56.41	
27	26-11-2019	887	434	321	149	56.41	
28	27-11-2019	924	474	321	149	54.20	
29	28-11-2019	924	467	321	149	56.41	
30	29-11-2019	1117	725	400	202	111.93	
31	30-11-2019	1226	765	456	335	198.81	
	Total (Cusecs)	71240.00	56738.00	45835.00	39186.00	28564.18	0.00
	Mcft	6155.14	4902.16	3960.14	3385.67	2467.95	0.000

22/11/2019

DEPUTY EXECUTIVE ENGINEER
NTR T.G.P. SUB DIVISION
R.N. KANDRIGA.

Water Gauge Readings 2019 6 A.M						
Sl.No.	Date	KM 67.500	KM 84.350	KM 107.200	KM 125.000	Flume
		Discharge	Discharge	Discharge	Discharge	Discharge
1	27-09-2019 to 30-11-2019	71240.00	56738.00	45835.00	39186.00	28564.18
2	01-12-2019	1414	971	571	451	285.46
3	02-12-2019	1439	1047	892	785	543.26
4	03-12-2019	1207	901	805	850	665.91
5	04-12-2019	1254	935	769	801	620.80
6	05-12-2019	1254	902	647	688	571.94
7	06-12-2019	1248	967	647	576	455.78
8	07-12-2019	1319	1102	892	752	548.01
9	08-12-2019	1343	1234	1049	975	722.46
10	09-12-2019	1373	1262	1092	975	791.23
11	10-12-2019	1241	1156	1049	975	785.87
12	11-12-2019	1098	993	892	926	743.40
13	12-12-2019	1038	928	720	801	650.76
14	13-12-2019	1053	943	604	675	543.26
15	14-12-2019	1053	952	574	635	505.80
16	15-12-2019	1053	958	786	692	543.26
17	16-12-2019	1053	943	786	692	586.45
18	17-12-2019	1091	976	798	722	596.20
19	18-12-2019	983	928	873	784	640.72
20	19-12-2019	881	817	814	753	655.80
21	20-12-2019	877	795	742	692	591.32
22	21-12-2019	877	791	724	675	571.94
23	22-12-2019	862	778	705	663	557.54
24	23-12-2019	862	789	705	663	543.26
25	24-12-2019	776	709	681	631	524.42
26	25-12-2019	771	709	631	571	473.77
27	26-12-2019	767	701	631	551	455.78
28	27-12-2019	767	691	596	537	438.02
29	28-12-2019	752	675	569	513	403.22
30	29-12-2019	756	684	569	513	403.22
31	30-12-2019	752	669	569	513	407.52
32	31-12-2019	765	687	552	479	377.76
	Total (Cusecs)	103219.00	84331.00	68769.00	60695.00	45768.32
	Mcft	8918.12	7286.20	5941.64	5244.05	3954.38

DEPUTY EXECUTIVE ENGINEER
NTR T.G.P. SUB DIVISION
B.N. KANDRIGA.

Water Gauge Readings 2020 6 A.M						
Sl.No.	Date	KM 67.500	KM 84.350	KM 107.200	KM 125.000	Flume
		Discharge	Discharge	Discharge	Discharge	Discharge
1	27-09-2019 to 31-12-2019	103219.00	84331.00	68769.00	60695.00	45768.32
2	01-01-2020	730	655	552	479	381.97
3	02-01-2020	747	661	552	479	386.19
4	03-01-2020	738	666	596	524	420.5
5	04-01-2020	749	672	596	524	433.62
6	05-01-2020	767	678	596	524	429.23
7	06-01-2020	771	692	633	565	464.74
8	07-01-2020	780	695	635	592	482.85
9	08-01-2020	789	703	635	592	487.41
10	09-01-2020	780	695	635	592	487.41
11	10-01-2020	780	701	635	592	482.85
12	11-01-2020	786	698	625	595	478.30
13	12-01-2020	758	646	598	551	446.00
14	13-01-2020	734	655	578	513	407.00
15	14-01-2020	721	634	578	513	424.86
16	15-01-2020	721	634	578	513	420.5
17	16-01-2020	707	629	578	513	416.16
18	17-01-2020	664	587	551	487	398.94
19	18-01-2020	668	581	460	397	304.79
20	19-01-2020	738	659	460	397	300.89
21	20-01-2020	738	664	618	513	386.19
22	21-01-2020	738	664	618	513	390.42
23	22-01-2020	694	608	561	487	386.19
24	23-01-2020	687	561	501	430	332.54
25	24-01-2020	670	530	461	389	304.79
26	25-01-2020	679	538	438	385	281.64
27	26-01-2020	679	538	438	385	277.85
28	27-01-2020	690	545	438	374	266.56
29	28-01-2020	742	596	461	398	304.79
30	29-01-2020	853	704	633	487	324.53
31	30-01-2020	889	738	671	606	464.74
32	31-01-2020	889	738	671	623	533.81
	Total (Cusecs)	126295.00	104296.00	86349.00	76227.00	58076.58
	Mcft	10911.89	9011.17	7460.55	6586.01	5017.82

DEPUTY EXECUTIVE ENGINEER
NTR T.G.P. SUB DIVISION
B.N. KANDRIGA.

Water Gauge Readings 2020 6 A.M						
Sl.No.	Date	KM 67.500	KM 84.350	KM 107.200	KM 125.000	Flume
		Discharge	Discharge	Discharge	Discharge	Discharge
1	27-09-2019 to 31-01-2020	**126295.00**	**104296.00**	**86349.00**	**76227.00**	**58076.58**
2	01-02-2020	**894**	**734**	**671**	**623**	**519.75**
3	02-02-2020	**923**	**776**	**671**	**623**	**515.08**
4	03-02-2020	**962**	**797**	**701**	**648**	**533.81**
5	04-02-2020	**947**	**777**	**701**	**663**	**552.77**
6	05-02-2020	**957**	**806**	**750**	**678**	**571.94**
7	06-02-2020	**957**	**800**	**756**	**707**	**601.10**
8	07-02-2020	**938**	**776**	**701**	**638**	**576.16**
9	08-02-2020	**943**	**789**	**731**	**678**	**567.12**
10	09-02-2020	**877**	**725**	**731**	**678**	**571.94**
11	10-02-2020	**819**	**671**	**701**	**648**	**543.26**
12	11-02-2020	**735**	**594**	**671**	**623**	**515.08**
13	12-02-2020	**847**	**690**	**653**	**606**	**510.44**
14	13-02-2020	**843**	**668**	**671**	**623**	**533.81**
15	14-02-2020	**809**	**628**	**625**	**592**	**533.81**
16	15-02-2020	**809**	**609**	**552**	**502**	**433.62**
17	16-02-2020	**809**	**605**	**535**	**475**	**386.19**
18	17-02-2020	**774**	**573**	**485**	**385**	**293.14**
19	18-02-2020	**802**	**597**	**501**	**422**	**324.53**
20	19-02-2020	**807**	**602**	**535**	**475**	**377.76**
21	20-02-2020	**786**	**573**	**502**	**452**	**352.86**
22	21-02-2020	**809**	**601**	**438**	**372**	**285.46**
23	22-02-2020	**806**	**610**	**438**	**372**	**277.85**
24	23-02-2020	**770**	**573**	**469**	**372**	**285.46**
25	24-02-2020	**770**	**592**	**504**	**404**	**300.89**
26	25-02-2020	**742**	**559**	**504**	**434**	**344.68**
27	26-02-2020	**708**	**518**	**443**	**389**	**300.89**
28	27-02-2020	**689**	**480**	**408**	**353**	**266.56**
29	28-02-2020	**689**	**496**	**394**	**346**	**248.09**
30	29-02-2020	**704**	**516**	**394**	**346**	**259.12**
	Total (Cusecs)	**150220.00**	**123031.00**	**103185.00**	**91354.00**	**70459.75**
	Mcft	**12979.01**	**10629.88**	**8915.18**	**7892.99**	**6087.72**

DEPUTY EXECUTIVE ENGINEER
NTR T.G.P. SUB DIVISION
B.N. KANDRIGA.

Water Gauge Readings 2020 6 A.M						
Sl.No.	Date	KM 67.500	KM 84.350	KM 107.200	KM 125.000	Flume
		Discharge	Discharge	Discharge	Discharge	Discharge
1	27-09-2019 to 29-02-2020	150220.00	123031.00	103185.00	91354.00	70459.75
2	01-03-2020	718	532	394	346	259.12
3	02-03-2020	732	553	438	366	259.12
4	03-03-2020	718	529	438	366	259.12
5	04-03-2020	709	513	373	274	169.11
6	05-03-2020	709	513	373	265	159.56
7	06-03-2020	709	502	394	285	175.57
8	07-03-2020	815	610	438	316	198.81
9	08-03-2020	1030	803	598	452	270.30
10	09-03-2020	1007	783	617	518	377.76
11	10-03-2020	1207	928	712	592	416.16
12	11-03-2020	1212	1016	920	736	548.01
13	12-03-2020	1240	1047	949	784	625.76
14	13-03-2020	1245	1097	996	839	645.73
15	14-03-2020	1229	1057	951	839	676.08
16	15-03-2020	1234	1046	929	829	665.91
17	16-03-2020	1268	1046	921	811	645.73
18	17-03-2020	1169	1019	951	829	660.85
19	18-03-2020	1147	1007	951	863	706.88
20	19-03-2020	1142	943	899	829	686.29
21	20-03-2020	1095	879	806	779	645.73
22	21-03-2020	1069	879	806	732	606.00
23	22-03-2020	1185	952	779	687	562.32
24	23-03-2020	1240	1030	806	671	510.44
25	24-03-2020	1228	1072	899	811	635.72
26	25-03-2020	1229	1072	921	829	670.99
27	26-03-2020	1263	1051	899	796	645.73
28	27-03-2020	1268	1097	899	796	625.76
29	28-03-2020	1268	1072	864	763	610.92
30	29-03-2020	1268	1092	899	763	596.2
31	30-03-2020	1258	1072	899	779	596.2
32	31-03-2020	1143	952	743	640	505.8
	Total (Cusecs)	183974.00	150795.00	126647.00	111539.00	86077.43
	Mcft	15895.35	13028.69	10942.30	9636.97	7437.09

DEPUTY EXECUTIVE ENGINEER
NTR T.G.P. SUB DIVISION
R.N. KANDRIGA.

Water Gauge Readings 2020 6 A.M						
Sl.No.	Date	KM 67.500	KM 84.350	KM 107.200	KM 125.000	Flume
		Discharge	Discharge	Discharge	Discharge	Discharge
1	27-09-2019 to 31-03-2020	183974.00	150795.00	126647.00	111539.00	86077.43
2	01-04-2020	1132	897	648	513	381.97
3	02-04-2020	687	609	648	572	438.02
4	03-04-2020	405	339	286	250	297
5	04-04-2020	405	325	263	184	123.31
6	05-04-2020	387	314	165	107	67.91
7	06-04-2020	378	314	165	107	65.55
8	07-04-2020	378	299	165	80	43.6
9	08-04-2020	372	293	165	80	39.57
10	09-04-2020	372	293	165	89	47.75
11	10-04-2020	372	293	165	89	56.41
12	11-04-2020	323	245	139	89	67.91
13	12-04-2020	290	220	110	59	41.57
14	13-04-2020	290	220	110	48	19.95
15	14-04-2020	290	220	94	34	8.79
16	15-04-2020	284	215	94	30	4.46
17	16-04-2020	200	161	0	0	0.00
	Total (Cusecs)	190539.00	156052.00	130029.00	113870.00	87781.20
	Mcft	16462.57	13482.89	11234.51	9838.37	7584.30

27/12/2020
DEPUTY EXECUTIVE ENGINEER
NTR T.G.P. SUB DIVISION
B.N. KANDRIGA.

27/7
EXECUTIVE ENGINEER
TELUGU GANGA PROJECT DIVISION
SRIKALAHASTI

ANNEXURE-III

GOVERNMENT OF ANDHRA PRADESH
PUBLIC HEALTH & MUNICIPAL ENGINEERING DEPARTMENT

From

Sri.J Venkateswarlu, B.tech,
Executive Engineer,
P.H. Special Division,
Besides Water Tanks,
Magunta Nagar,
Nellore.

To

The District Forest Officer,
Nellore

Lr. No. NLR/AIIB/DB/ATO/2019/231 Dt: 30.06.2020

Sir,

Sub:- Water Supply Improvement scheme including operation and maintenance in municipal Towns Sullurupeta & Naidupeta in SPSR Nellore District , Chittoor & puttur in Chittoor District, Addanki, Kanigiri, Chimakurthy & Giddaluru in Prakasam District of Public Health Circle, Nellore(Package-I) with Asian infrastructure investment bank(AIIB) Funding- –laying of pipeline in along the R&B Road which is all along the reserve Forest area – Permission - Requested -Regarding.

Ref:- 1.Superintending Engineer (PH) Agt. No. 16/2018-19 Dt:18-02-2019
2. Dy.Executive Engineer,PH Spl.Sub Division, Gudur Letter No:42M/AIIB/Sullurupeta/2020 Dt:29.06.2020

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It is to inform that the Government of Andhra Pradesh have accorded administrative sanction for the work of "Water Supply Improvement scheme including operation and maintenance in municipal Towns Sullurupeta & Naidupeta in SPSR Nellore District , Chittoor & puttur in Chittoor District, Addanki, Kanigiri, Chimakurthy & Giddaluru in Prakasam District of Public Health Circle, Nellore(Package-I) with Asian infrastructure investment bank(AIIB) Funding" in G.O.Ms No:144 (MA &UD Dept) Dt:07.05.2018. Technically sanctioned for Rs.142.10 Crores by the Engineer –In – Chief, PH Tadepalle in ENC(PH) R No:104/2018-19 Dt:04.09.2018. Tenders called for and the work was entrusted to M/s NCC Limited., Hyderbad vide SE(PH) Nellore Agt No: 16/2018-19 Dt:18-02-2019.

It is proposed Raw water 600mmdia DI K7 Gravity Main from sai canal to proposed SS tank @ Mangalampadu Irrigation Tank. The alignement of Gravity main runs all along R&B road from Sri kalahasti to BN Kandriga Road. The forest land falls in two stretches along the R&B road i.e CH.6/400 to 6/900 and from Ch.11/700 to 13/200.

In this connection, to provide drinking water to Sullurupeta Public, The District Forest Officer, Nellore is requested to accord necessary permission to lay the Water Supply pipeline all along the R&B road from CH.6/400 to 6/900 and from Ch.11/700 to 13/200 which is along reserve forest area.

Yours faithfully,

30/6/2020

Executive Engineer
P.H Special Division, Nellore.

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30/6/2020

ANNEXURE-IV

PUBLIC CONSULTATION AND DISCLOSURE SULLURPETA ULB

STAKEHOLDER QUESTIONNAIRE

23/7/2020

To

PHMED
Sullurupeta
Nellore

from

ch. munidevathi
వట్రపాళెం
Ph.no:- 8465027094

① water tanks మరియు పైపులైను వేసేటప్పుడు మొక్కలు మరియు చెట్లు పోవడం దానికి ఏవిధమైన పరిరక్షణ తీసుకొంటారు

② మీరు పని చేస్తున్నప్పుడు మెట్లు ప్రహరి గోడలు పగలి కొట్టినప్పుడు దానికి ఏవిధమైన చర్యలు తీసుకుంటారు.

③ ఈ ప్రాజెక్టు వల్ల మురుగు నీటి వెలువడుతుంది దానికి మీరు ఏవిధమైన చర్యలు తీసుకుంటారు.

P.B
21/08/2020
AE/PH/Sullurpeta

Ch.B
23/7/2020

తేది :- 20/07/20

To

కమీషనర్ గారు

సూర్యాపేట మున్సిపాలిటీ

From

P. రాజు శేఖర్

మునగాల పాలెం

హరిజన వాడ

P.HNO -> 8074220619

1.) పైపులైన్ వేసేటప్పుడు చిన్న చిన్న లీక్‌లు కాస్తంగా వచ్చినప్పుడు ఏ విధమైన జాగ్రత్తలు తీసుకుంటారు.

2.) పైప్‌లైన్‌ల వల్ల దుర్వాసన. దాని నుండి కాపాడటానికి ఏ విధమైన చర్యలు తీసుకుంటారు.

3.) పైపు పని చేస్తున్నప్పుడు మట్టి, రహదారులు దెబ్బతిన్నప్పుడు దానికి ఏ విధమైన చర్యలు తీసుకుంటారు.

Name

P. Raj [illegible]

DATE :- 17/07/2020

"FROM"

M. Pothaiah,
Vatrapalem village,
Sullurupeta Mandal,
SPSR Nellore (Dt),
A.P.
Phone :- 8374185219

"TO"

కమిషనర్ సార్ గారికి,
సూళ్ళూరుపేట - మున్సిపాలిటి.

1. ~~ఈ~~ ప్రాజెక్ట్ వల్ల దుమ్ము, ధూళి, పెలువడును దానికి మీరు ఏ విధమైన చర్యలు తీసుకుంటారు.

2. పైపులైను వెసేటప్పుడు చిన్న చిన్న షాప్‌లు అర్థంగా వచ్చినప్పుడు ఏ విధమైన జాగ్రత్తలు తీసుకోగలుగుతారు

3. ఈ ప్రాజెక్ట్ చేసున్నప్పుడు పైపులకోసం తవ్విన మట్టిని ప్రజలకు ఆటంకం కలగకుండా ఏ విధమైన చర్యలు తీసుకుంటారు

4. మీరు పని చేస్తున్నప్పుడు, మెట్లు, ప్రహరిగోడలు పగలగొట్టినప్పుడు దానికి ఏ విధమైన చర్యలు తీసుకుంటారు.

MP
17/7/20.

తేది :- 23/7/2020

TO
~~కమీషనర్ గారు~~
PHMED
Sullurpeta
Nellore

FROM
T కోమలి
వట్రపాలెం
P.h No - 7382502587

1.) పైపులైన వేసేటప్పుడు చిన్న చిన్న పొరపాట్లు అదృష్టంగా వచ్చినప్పుడు ఏ విధమైన జాగ్రత్తలు తీసుకోగలుగుతారు.

2) ఈ ప్రాజెక్ట్ వల్ల దుమ్ము ధూళి వెలువడుతుంటే దానికి మీరు ఏ విధమైన చర్యలు తీసుకుంటారు.

3) water tanks మరియు పైపులైను వేసేటప్పుడు మొక్కలు మరియు వృక్ష సంపదను దానికి ఏ విధమైన పరిరక్షణ తీసుకుంటారు.

P.R
21/08/2020
AE/PH/ sullurpeta

T కోమలి
23/7/2020

తేది: 19/07/2020

TO
కమిషనర్ గారు,
సూళ్ళూరుపేట మున్సిపాలిటం.

From:
M. Anusha,
Vatrapalem (Vi),
Sullurupeta (MD),
Nellore (DT),
Ph: 7995290539.

1) water terms మరియు పైపులైను వేసేటప్పుడు మొక్కలు & వృక్షాలు ఉండును దానికి ఏ విధమైన పరిరక్షణ తీసుకుంటారు,

2) ఈ ప్రాజెక్టు వల్ల దుమ్ము ధూళి వెలువడును దానికి మీరు ఏ విధమైన చర్యలు తీసుకుంటారు

3) పైపు లైను వేసేటప్పుడు చిన్న చిన్న పాములు ఉధృతంగా, వచ్చినప్పుడు ఏ విధమైన జాగ్రత్తలు తీసుకోగలుగుతారు

4) మీరు పని చేస్తున్నప్పుడు మెట్లు ప్రహరిగోడలు పగలగొట్టినప్పుడు దానికి ఏ విధమైన చర్య తీసుకుంటారు.

M. Anusha
19/7/20

Sullurupeta ULB
Date: 29/7/2020
Nellore Circle
Nellore (Dt)

To
The Stakeholders,
Sullurpeta, Nellore Circle.

Subject : Reply Letter – Implementation measures on Water Supply Project.

① Water tankలు మరియు పైపులైను వేసేటప్పుడు చెట్లు నరకాల్సి వస్తే దానికి ఏ విధమైన పరిష్కారం తీసుకుంటారు.

Ans Sullurupeta ULB లో EIA and EMP Report లో చెట్లు కొట్టవలసి వస్తే, వాటిని నాటినట్లైతే 1:5 నిష్పత్తిలో చెట్లు నాటుతారు. ఈ ప్రాజెక్టు వలన ఎటువంటి చెట్లు నష్టపోవు.

② మీరు ఉపయోగిస్తున్న పైపులు మట్టి ప్రమాదకరంగా పగిలి గాయాలు వస్తే దానికి ఏ విధమైన చర్యలు తీసుకుంటారు.

A అటువంటి సందర్భము లేదు. మామూలుగా ప్రాజెక్టు మొదలు పైపులైన్లు వేసేటప్పుడు అన్ని నిబంధనలు ప్రభుత్వ వారి మున్సిపాలిటీ వారి పర్యవేక్షణలో జరుగుతుంది.

③ ఈ ప్రాజెక్టు వల్ల మట్టి మాకు వెళ్తున్నప్పుడు దానికి ఎటువంటి చర్యలు తీసుకుంటారు.

Ans మట్టిని కంట్రోల్ చేయడానికి వాటర్ స్ప్రేయింగ్ చేస్తాము.

④ పైపులైన్లు వేసేటప్పుడు చిన్న చిన్న షాపులు తొలగించవలసి వస్తే ఏవిధమైన జాగ్రత్తలు తీసుకుంటారు!

A ఈ వాటర్ సప్లై ప్రాజెక్టు షాపులు ఇబ్బంది అయ్యేలా ప్లాన్ చెయ్యబడలేదు! మున్సిపాలిటీ వారి స్థలంలో ప్లాన్ చెయ్యబడింది! వారికి ఎటువంటి హాని జరగదు!

P.Bb
24/08/2020
AE/PH/Sullurpeta

STAKEHOLDER OPINIONS AND FEEDBACKS

Feed Back /Opinion of the Stakeholder Form

S.No	Name of Stakeholder	Address of the Stakeholder	Query	Reply given by the concern official	Signature
1	P. Rajasekhar	Mannarpollur Harizanwada, Sullurpeta	Q1	P. BHARATH KUMAR ASSISTANT ENGINEER (PH)	
2	M. Potteiah	Vatrapalem, Sullurpeta	Q2	P. BHARATH KUMAR ASSISTANT ENGINEER (PH)	
3	M. Anusha	Vatrapalem, Sullurpeta	Q3	P. BHARATH KUMAR ASSISTANT ENGINEER (PH)	
4	T. Komali	Vatrapalem, Sullurpeta	Q4	P. BHARATH KUMAR ASSISTANT ENGINEER (PH)	
5	CH. Nunibharathi	Vatrapalem, Sullurpeta	Q4	P. BHARATH KUMAR ASSISTANT ENGINEER (PH)	

ACKNOWLEDGEMENT

ACKNOWLEDGEMENT

As suggested by Asian Infrastructure Investment Bank (AIIB), the Project Management Unit (PMU) of Andhra Pradesh Urban Water Supply and Septage Management Improvement Project (APUWSSMIP) has planned to organize a Public Consultation or Public Disclosure of EIA and EMP report, prepared for Sullurpeta Municipality/ ULB through online/ digital processes. The Purpose of the online Public Consultation/Public Disclosure is to make known to the public, about the Environmental Impacts of the project.

In this context, the following documents have been submitted to this office by PMC/ Aarvee Associates Architects Engineers and Consultants Pvt., Ltd., to make them available in the online public disclosure process.

1. EIA and EMP report for Sullurpeta Municipality /ULB in soft copy.

2. Executive Summary of the EIA and EMP report in English and Telugu versions in hard copies to display on the Notice Board.

3. Feedback/ Opinion form in soft copy.

Signature of the Commissioner:

ULB Name: SULLURPET

Date: 24-07-2020

ACKNOWLEDGEMENT

As suggested by Asian Infrastructure Investment Bank (AIIB), the Project Management Unit (PMU) of Andhra Pradesh Urban Water Supply and Septage Management Improvement Project (APUWSSMIP) has planned to organize a Public Consultation or Public Disclosure of EIA and EMP report, prepared for Sullurpeta Municipality / ULB through online/ digital processes. The Purpose of the online Public Consultation/Public Disclosure is to make known to the public, about the Environmental Impacts of the project.

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1. EIA and EMP report for Sullurpeta Municipality /ULB in soft copy.

2. Executive Summary of the EIA and EMP report in English and Telugu versions in soft copies to display the print outs on the Notice Board.

3. Feedback/ Opinion form in soft copy.

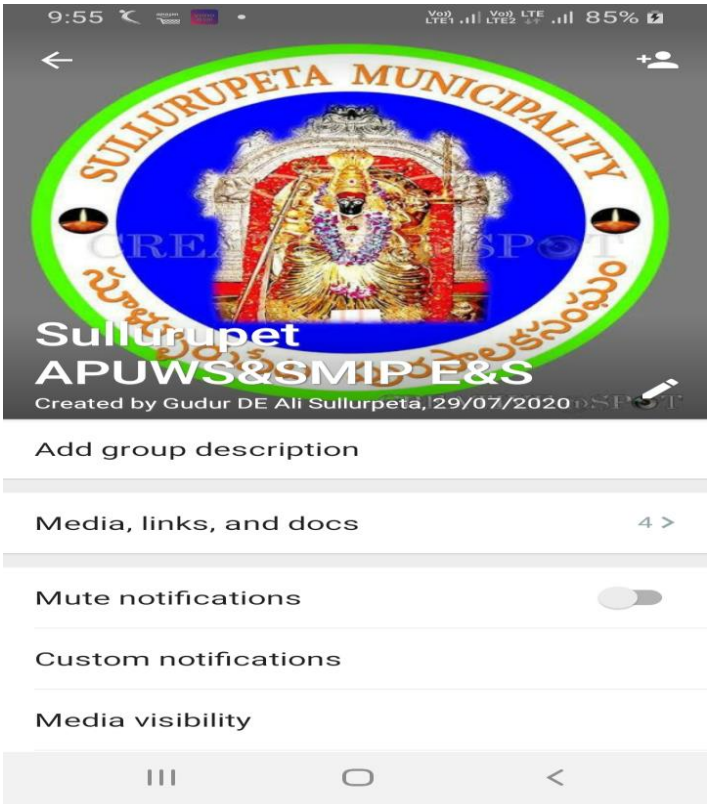
Signature of the PHMED Engineer: P.P

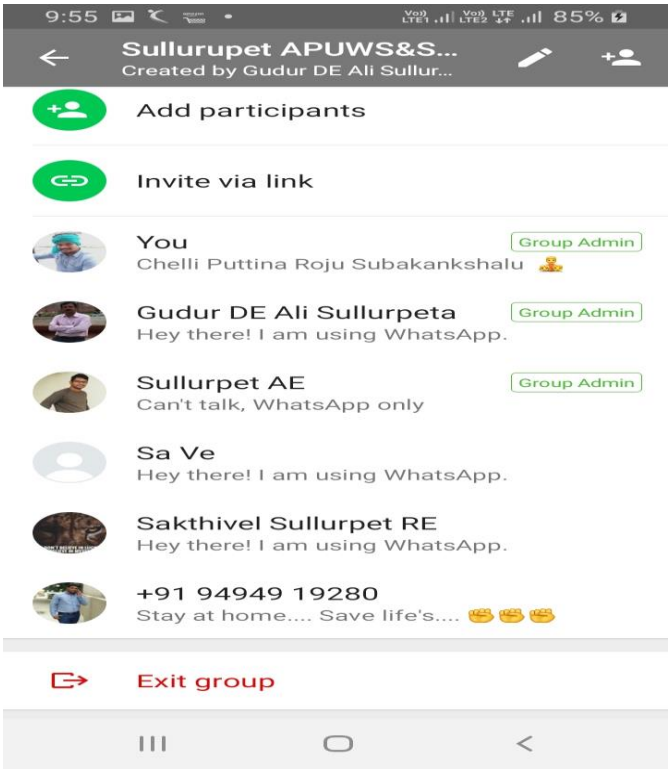
AE/PH/Sullurpeta

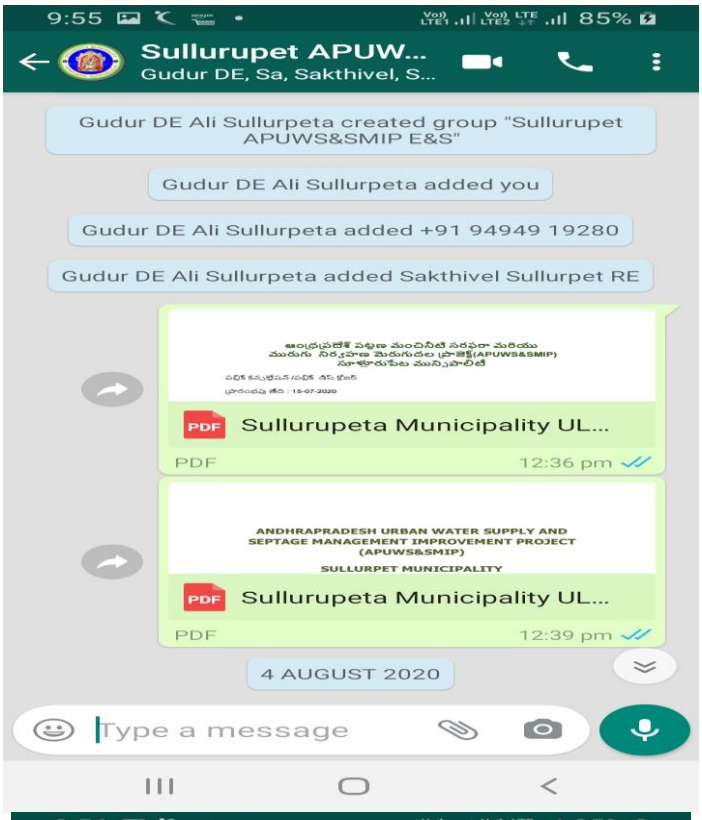
Name of the Circle/Divisional office: Public health circle, Nellore

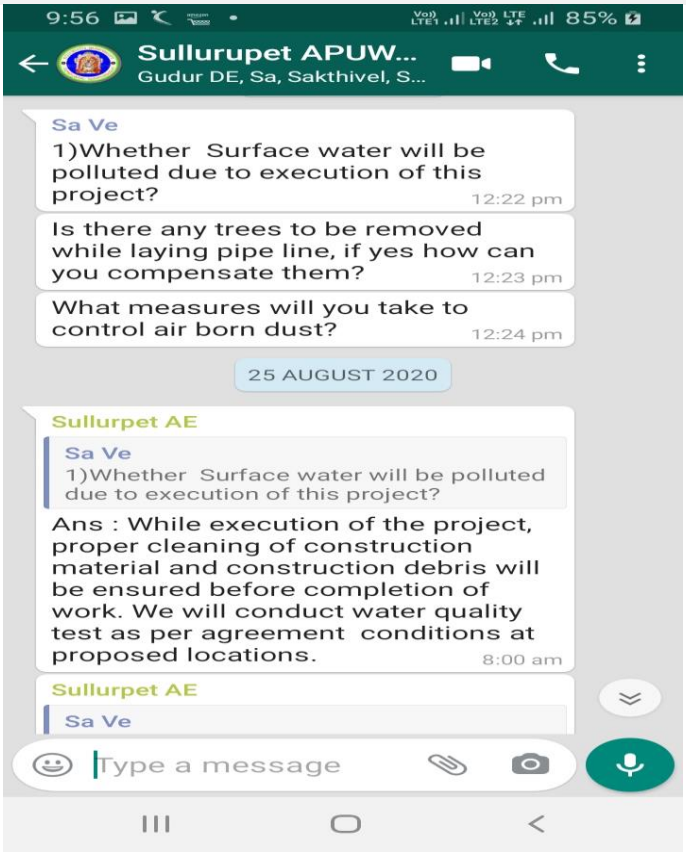
Date: 24/07/2020

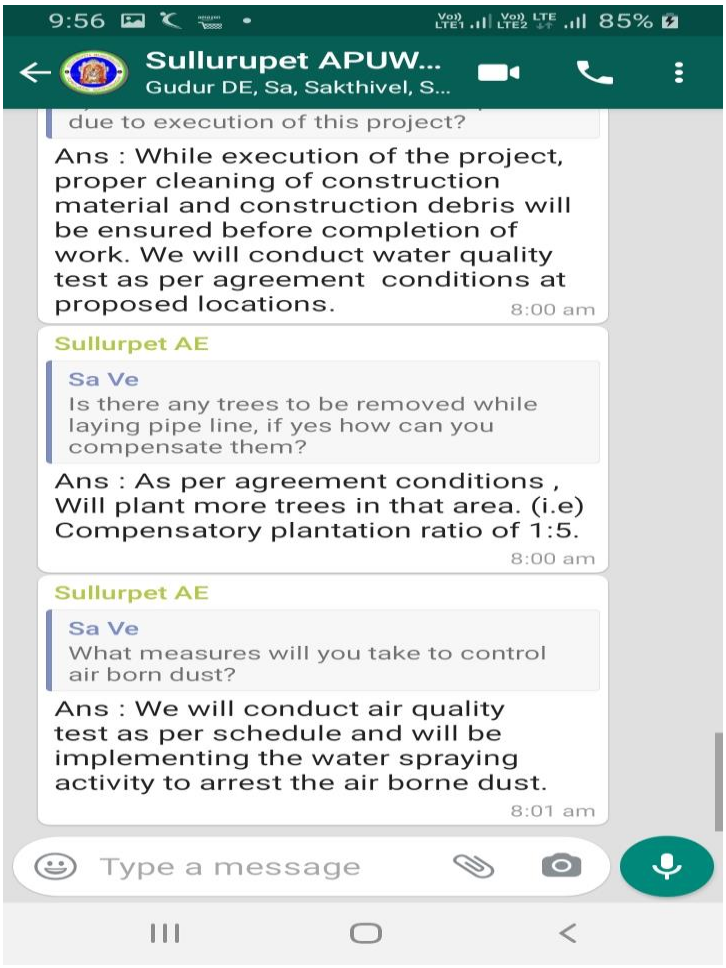
CONSULTATION OVER WHATSAPP GROUP






9:55
85%
Sullurupet APUW...
Gudur DE, Sa, Sakthivel, S...
Gudur DE Ali Sullurpeta created group "Sullurupet APUWS&SMIP E&S"
Gudur DE Ali Sullurpeta added you
Gudur DE Ali Sullurpeta added +91 94949 19280
Gudur DE Ali Sullurpeta added Sakthivel Sullurpet RE
Sullurupeta Municipality UL...
PDF
12:36 pm
ANDHRAPRADESH URBAN WATER SUPPLY AND SEPTAGE MANAGEMENT IMPROVEMENT PROJECT (APUWS&SMIP)
SULLURPET MUNICIPALITY
Sullurupeta Municipality UL...
PDF
12:39 pm
4 AUGUST 2020
Type a message


9:56
85%
Sullurupet APUW...
Gudur DE, Sa, Sakthivel, S...
Sa Ve
1)Whether Surface water will be polluted due to execution of this project?
12:22 pm
Is there any trees to be removed while laying pipe line, if yes how can you compensate them?
12:23 pm
What measures will you take to control air born dust?
12:24 pm
25 AUGUST 2020
Sullurpet AE
Sa Ve
1)Whether Surface water will be polluted due to execution of this project?
Ans : While execution of the project, proper cleaning of construction material and construction debris will be ensured before completion of work. We will conduct water quality test as per agreement conditions at proposed locations.
8:00 am
Sullurpet AE
Sa Ve
Type a message


9:56
85%
Sullurupet APUW...
Gudur DE, Sa, Sakthivel, S...
due to execution of this project?
Ans : While execution of the project, proper cleaning of construction material and construction debris will be ensured before completion of work. We will conduct water quality test as per agreement conditions at proposed locations.
8:00 am
Sullurpet AE
Sa Ve
Is there any trees to be removed while laying pipe line, if yes how can you compensate them?
Ans : As per agreement conditions , Will plant more trees in that area. (i.e) Compensatory plantation ratio of 1:5.
8:00 am
Sullurpet AE
Sa Ve
What measures will you take to control air born dust?
Ans : We will conduct air quality test as per schedule and will be implementing the water spraying activity to arrest the air borne dust.
8:01 am
Type a message

ULB: Sullurpet ULB
District, Circle: Public Health Circle, Nellore.

Date of latest EIA submission to PHMED: 15/07/2020
Date of EIA Review by PHMED: 21/07/2020

ANDHRA PRADESHURBAN WATER SUPPLY & SEPTAGE MANAGEMENT IMPROVEMENT PROJECT

Environmental Impact Assessment Review Checklist

Objective of this document

This document is intended to provide guidance, in the first instance, to PHMED staff located in each ULB, and, in the second instance, to the PMU, in reviewing and verifying the completeness and accuracy of environmental impacts as captured inthe ULB-level EIAs prepared by the PMC.This checklist is focused on the scientific and technical adequacy of the EIAs and specific themes which are important to the AIIB as reflected in its Environmental and Social Policy. The checklist provides guidelines to PHMED and the PMU for offering high quality feedback to the PMC in order to ensure the EIAs and EMPs prepared meet AIIB's Environmental and Social Standard 1on *Environmental and Social Assessment and Management.*

By replying to a set of questions,PHMED and PMU staff should be able to concludewhich parts, if any, of the EIAsdo not yet meetthe standards outlined in AIIB's ESP and which information may be missing or is under-evaluated. By doing so, PHMED and PMU reviewers can formulate constructive and credible feedback to share with the PMC.

#	Item	Status[1]	Comments/Notes
	Executive Summary		
1	Does the report have an Executive Summary (1 page) including key environmental impacts, properly categorized according to severity, mitigation measures, and results of public consultation.	Yes ☑ Partially ☐ No ☐	
2	Was full consultation carried out during scoping, and are the comments and views fully presented?[2]	Yes ☑ Partially ☐ No ☐	As suggested by AIIB workshops were conducted at state level in guntur and 3 regional level public consultations were conducted at anantapur, Kadapa and vijayanagaram by PMU.
	1. INTRODUCTION		
3	**Sub-project justification.** Has the justification for the sub-project been clearly laid out?	Yes ☑ Partially ☐ No ☐	
4	Has the subproject been screened against the list of ineligible activities (negative list of the AIIB)?	Yes ☑ No ☐	
5	**Indian regulatory and AIIB policy requirements.** Is the alignment of the project with relevant strategies, development plans,	Yes ☑ Partially ☐ No ☐	

[1]If "Partially" is checked, please provide further details in the "Comments/Notes" column, as well as in any other case where further information is needed, e.g. to elaborate on identified risks and impacts of the sub-project.
[2]Although not required under Indian Regulations for this project, section 13.5.2 of the project's Environmental and Social Management Planning Framework (ESMPF) requires the EMP (in English) as well as the Executive Summary of the EIA/EMP(in English and Telugu) to be displayed at the Municipal Commissioner Offices as well as the local offices of PHMED.These documents should be displayed for a period of at least 14days. Comments received, if relevant,should be incorporated into the EIA and Executive Summary.

ULB: Sullurpet ULB
District, Circle: Public Health Circle, Nellore.

Date of latest EIA submission to PHMED: 15/07/2020
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	and regulatory frameworks including AIIB ESP explained?		
6	**Other legislative and regulatory considerations.** Does the report adequately summarize the policy/legal framework?	Yes ☑ Partially ☐ No ☐	
	2. PROJECT LOCATION AND BASELINE DATA		
7	**Project location.** Has the project location been clearly identified including through an adequately scaled map?	Yes ☑ Partially ☐ No ☐	schematic diagrams are incorporated in the report
8	**Geographical and demographic characteristics.** Are locations or features of landscape, townscape, archaeological, historic, architectural or other community or cultural importance in the area that may be negatively affected by project described, including any designated or protected sites, landscapes and important viewpoints?	Yes ☑ Partially ☐ No ☐	
9	Is the existing land use plan of the area to be occupied by the project and the surrounding area presented? Are the land uses of the area to be occupied by the project and the surrounding area described, including any potential land use conflicts with existing land uses?	Yes ☑ Partially ☐ No ☐ ☐	
10	**Metereological characteristics.** Is meteroelogical baseline data presented and is this data based on long-term as well as recent measurements?	Yes ☑ Partially ☐ No ☐	
11	**Air quality.** Has air quality data been accurately presented and is this data based on long-term as well as recent measurements?	Yes ☑ Partially ☐ No ☐	
12	**Noise pollution.** Has noise data been accurately presented and is this data based on long-term as well as recent measurements?	Yes ☑ Partially ☐ No ☐	
13	**Water quality.** Has water quality data been accurately presented and is this data based on long-term as well as recent measurements?	Yes ☑ Partially ☐ No ☐	
14	**Soils.** Has data on soils been accurately presented and is this data based on long-term as well as recent measurements?	Yes ☑ Partially ☐ No ☐	
15	**Flora and fauna.** Has data on the project area's flora and fauna been accurately presented and is this data based on long-term as well as recent measurements?	Yes ☑ Partially ☐ No ☐	
16	**Public health and solid waste management.** Is data on public health and solid waste		The relevant information was collected from ULB

ULB: Sullurpet ULB
District, Circle: Public Health Circle, Nellore.

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	management in the project area presented and is this data based on both long-term as well asrecent observations?	yes	and Same was incorporated in the report
	3. PROJECT DESCRIPTION AND ANALYSIS OF ALTERNATIVES		
17	**Existing water supply system.** Does the report accurately describe the existing water supply scheme?	Yes ☑ Partially ☐ No ☐	
18	**Proposed water supply system.** Does the report adequately describe the proposed project, using appropriately-scaled maps and diagrams?	Yes ☑ Partially ☐ No ☐	
19	Is the program for implementation of the project described, giving estimated duration of the project, for construction, operation, and decommissioning (if appropriate)?	Yes ☑ Partially ☐ No ☐	shall be included as per the DPR report.
20	Are all activities described during (i) construction, (ii) operation and (iii) decommissioning stages (if appropriate), including size, capacity, throughput, input and output?	Yes ☑ Partially ☐ No ☐	
21	Are any other existing or planned developments with which the project could have cumulative effects identified?	Yes ☑ Partially ☐ No ☐	There is no existing are planned a developmental activity in parallel with APUWSSMIP.
22	Are the types and quantities of raw materials and energy needed for construction and operation discussed?	Yes ☑ Partially ☐ No ☐	yes, All the raw materials shall be brought from licensed/approved quarries only.
23	**Analysis of alternatives.** Are alternatives considered during the project development described in detail, with their respective environmental effects?	Yes ☑ Partially ☐ No ☐	
24	Is the baseline environmental situation in the 'no action' situation described?	Yes ☑ Partially ☐ No ☐	
	4. KEY ENVIRONMENTAL IMPACTS		
25	**General.** Have impacts been separated out by phase (planning and design, construction, operation)?	Yes ☑ Partially ☐ No ☐	
26	Have all impacts been clearly indicated, including in tabular form, to be either non-existent, insignificant, moderate, or significant?	Yes ☑ Partially ☐ No ☐	
27	Are any risks associated with the project discussed, such as risks from handling of hazardous materials, risks from spills, fire, explosion, risks of traffic accidents, risks from breakdown or failure of processes or facilities, and risks from exposure of the project to natural disasters?	Yes ☑ Partially ☐ No ☐	

ULB: Sullurpet ULB
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28	**Air quality.** Has potential deterioration of air quality during construction or operation been assessed?	Yes ☑ Partially ☐ No ☐	
29	**Noise pollution.** Have impacts short-terms construction phase impacts such as noise and vibration from construction equipment been assessed?	Yes ☑ Partially ☐ No ☐	
30	**Water quality.** Are relevant direct, primary effects on the hydrology and water quality of water features described, and where appropriate quantified?	Yes ☑ Partially ☐ No ☐	
31	Is the assessment of Water Quality based on IS 10500 for drinking water standards?	Yes ☑ No ☐	
32	Does the report assess the potential degradation of water bodies due to discharge of wastes/ effluents from the sub-project, e.g. through the increase in untreated liquid waste due to increased supply of water?	Yes ☑ Partially ☐ No ☐	
33	Has the potential risk of accidental release of potentially hazardous solvents, acidic and alkaline materials, or chlorine gas from water treatment plants been assessed?	Yes ☑ Partially ☐ No ☐	
34	**Water quantity/Source sustainability.** Has the information on source sustainability been requested by PHMED from the Irrigation Department?	Yes ☑ No ☐ Yes, but not recvd. ☐	Issue of water allocation of quantum of water is under progress
35	Is the sustainability of the water source adequately described? Does it justify the construction of the water supply system? Are the hydrology, water quality and use of any water resources that may be affected by the project described?	Yes ☑ Partially ☐ No ☐	
36	Arethere any ground sources being used in the ULB scheme and, if so, is the result of the last yield test described?	N/A ☐ Yes, to all ☐ No ☑	yield test was not required as the source of scheme is surface water
37	What is the status of the statutory water allocations and permissions in this ULB?	yes	under process
38	**Flora and Fauna.** Are relevant direct, primary effects on fauna, flora, and habitats described, and where appropriate quantified?	Yes ☑ Partially ☐ No ☐	
39	Is the Project located within or nearby environmentally sensitive areas, protected areas (e.g. intact natural forests, mangroves, wetlands or other habitats including endangered/threatened species?)	Yes ☑ No ☐	
40	Does the report assess the potential impact of ecological disturbances on sensitive habitats, if	N/A ☐	

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.	applicable?	Yes, to all ☑ No ☐	
41	**Public health and solid waste management.** Are public health risks from the sub-project due to discharge of solid or liquid waste, noise or air pollution assessed?	yes	Covid 19 scenario impact should be included mitigative measures adopted
42	Has the report assess the potential impacts from an aggravation of solid waste streams in the area?	yes	
43	Disease transmission from inadequate waste disposal? Nuisance crated byopen defecation by workers at construction sites.	.yes	waste will be disposed to the nearest dumpyard. There is no open defecation.
	5. ENVIRONMENTAL MANAGEMENT PLAN		
44	Does the report include an EMP?	Yes ☑ Partially ☐ No ☐	
45	Are the measures cited in the EMP specific to the project site?	Yes ☑ Partially ☐ No ☐	
46	Where there are significant adverse effects on any aspect of the environment is the potential for mitigation of these effects discussed?	Yes ☑ Partially ☐ No ☐ N/A ☐	
47	Are any measures which the PMC proposes to implement to mitigate effects clearly described and their effect on the magnitude and significance of impacts clearly explained?	Yes ☑ Partially ☐ No ☐	
48	**Specific disposal-related mitigation measures.** Are the methods for collecting, storing, treating, transporting, and finally disposing of all appropriate residues and emissions (i.e. solid wastes, liquid effluents, gaseous and particulate emissions) described?	Yes ☑ Partially ☐ No ☐	
49	Are the locations for final disposal of all appropriate residues and emissions (i.e. solid wastes, liquid effluents, gaseous and particulate emissions) clearly indicated by way of a map and GPS coordinates?	Yes ☑ Partially ☐ No ☐	
50	Are responsibilities for implementation of mitigation, including funding, clearly defined by contract (source vs distribution)?	Yes ☑ No ☐	
51	Is a monitoring plan elaborated in the EIA?	Yes ☑ No ☐	
52	Are the indicators for monitoring clearly defined based on the baseline information, the objective, and likely impacts identified by the	Yes ☑ No ☐	

ULB: Sullurpet ULB
District, Circle: Public Health Circle, Nellore.

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Date of EIA Review by PHMED: 21/07/2020

	EIA?		
53	Is a plan outlined for how affected stakeholders will be informed of these adverse effects?	Yes ☑ No ☐	online public consultation on EIA env reports at each ULB is under Progress

Please return comments on the EIA to the PMCby way of an unsigned but dated checklist, if the review of the EIA, using this checklist as a guide, indicates that there are major gaps in the information and assessment conducted which the PMC should address.

CERTIFICATION

(to be filled in once EIA/EMPis, in the opinion of the PHMED engineer, finalized and can be submitted to the PMU for further review)

I certify that I have thoroughly examined and reviewed the EIA report submitted and reviewed all potential adverse effects of this subproject. To thebest of my knowledge, all environmental impacts are adequately identified and the proposedenvironmental management plan will be adequate to avoid or minimize all adverse environmentalimpacts.

PHMED Engineer (signature) ..... 27/07/2020, AE/PH/Sullurpeta

Name (capital letters): PAYYAVULA BHARATHKUMAR

Date: 27/07/2020
(DD-mmm-YYYY)

Reference Sources:

AIIB Environmental and Social Policy (ESP)
International Association for Impact Assessment (IAIA) guide to review of EIA reports.