Initial Environmental Examination

Document Stage: Draft for consultation
Project Number: 53276-002
June 2023

India: Tripura Urban and Tourism Development Project – Design, Build and Operate Contract for Comprehensive Water Supply Improvement Works in Cluster IIA Towns of Tripura

Package NO: WS-02/P-02

Prepared by Tripura Urban Planning and Development Authority (TUDA), Urban Development Department, Government of Tripura for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 31 March 2023)

Currency Unit	–	Indian rupee (₹)
₹ 1.00	–	$ 0.01
$1.00	=	₹ 82.15

ABBREVIATIONS

ADB	–	Asian Development Bank
ANP	–	Amarpur Nagar Panchayat
BMC	–	Belonia Municipal Council
CPCB	–	Central Pollution Control Board
CTE	–	Consent to establish
CTO	–	Consent to operate
DBE	–	Design Basis Earthquake
DBO	–	Design, build and operate
DHQ	–	Districts headquarter
DTW	–	Deep Tube Well
DWS	–	Drinking water & sanitation
EAC	–	Expert appraisal committee
EARF	–	Environmental assessment and review framework
EHS	–	Environment, health and safety
EIA	–	Environmental impact assessment
EMP	–	Environmental management plan
EMS	–	Environmental management specialist
EPC	–	Engineering, Procurement & Construction
GLSR	–	Ground level storage reservoir
GoT	–	Government of Tripura
GRC	–	Grievance redress committee
GRM	–	Grievance redress mechanism
IEE	–	initial environmental examination
IRP	–	iron removal plant
MMC	–	Melaghar Municipal Council
MoEFCC	–	Ministry of Environment, Forest and Climate Change
NWQMP	–	National Water Quality Monitoring Programme
TSPCB	–	Tripura State Pollution Control Board
NOC	–	No objection certificate
OHS	–	Occupational health and safety
PGA	–	Peak Ground Acceleration
PIU	–	project implementation unit
PMSC	–	Project management supervision consultant
PMU	–	Project management unit
PMSC	–	Project Management & Supervision Consultant
RFA	–	Recorded Forest Area
ROW	–	Right of way
SDCC	–	Sustainable Development and Climate Change Department
SGC	–	Safeguards and gender cell
SPS	–	Safeguard Policy Statement
TOR	–	Terms of Reference

TUDA	–	Tripura Urban Planning and Development Authority
TUTDP	–	Tripura Urban and Tourism Development Project
UMC	–	Udaipur Municipal Council
WHO	–	World Health Organization
WTP	–	Water treatment plant

WEIGHTS AND MEASURES

dBA	-	decibel
°C	-	degree Celsius
km	-	kilometer
lpcd	-	litre per capita per day
m	-	meter
mgbl	-	meter below ground level
mm	-	millimeter
MLD	-	million liters per day
km^2	-	square kilometer

NOTE

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

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EXECUTIVE SUMMARY

Proposed Tripura Urban and Tourism Development Project (TUTDP) will improve the municipal infrastructure and public services and will lay the foundation for tourism development in the State of Tripura. Tripura is in the Northeast Region (NER) of India, covering an area of 10,490 square kilometers, with a population of 4.1 million (estimated 2022), and Agartala as the state's capital. The project targets key urban local bodies (ULBs) along the main national highways in Tripura, major infrastructure components of which include water supply, stormwater drainage, communal or neighborhood roads, and tourism development support.

The project is aligned with the following impact(s): clean and sustainable environment in ULBs achieved, and Tripura increasingly recognized in the India tourism industry as a new destination. The project will have the following outcome: Adequate, safe, and climate- and disaster-resilient, urban services (water, storm drainage, and municipal roads) provided and sustainable tourism improved in project areas. Project has four outputs: (i) Output 1: Municipal reforms and capacity of ULBs strengthened, (ii) Output 2: Urban infrastructure improved. The project will improve various public infrastructures, such as (i) water supply, (ii) stormwater drainage, and (iii) municipal roads, (iii) Output 3: Tourist destinations improved, and (iv) Output 4: Capacity of tourism corporation's operational services improved. The government of Tripura acting through Urban Development Department (UDD) will be the project executing agency. Tirupa Urban Development Authority (TUDA) and Tripura Tourism Development Corporation Limited (TTDCL) will be the implementing agencies.

Under phase 1 of project, 12 towns have been selected for improvement of Water Supply, Sewerage & Septage Management, Developments of Drains & Roadside Drains and Urban Transport. Tripura Urban and Tourism Development Project **(TUTDP)** will be implemented over a 5-year period. **Udaipur, Amarpur, Bishramganj, Melaghar and Belonia** are five project towns selected under this package (**Cluster IIA**) Udaipur will be the Cluster headquarter. Water supply improvement works are proposed in these five towns under the TUTDP. Following are the proposed components:

Udaipur town - Subproject includes the following: (i) Construction of intake structure and approach bridge on River Gomati, (ii) Construction of 7.6 MLD WTP at Banduar, (iii) Laying of approx. 837 m, Dia. 400 mm DI K9 pipe - Raw water Transmission Main & culvert above *nallaha* for carrying pipe; (iv) Laying of approx..6.28 km, Dia. (400mm to 250mm) DI K9 Pipes - Clear water Transmission main; (v) Construction of 2 nos. OHSR. one at Bhagini Nibedita School campus (Capacity 900 KL), and one at Ramesh School campus (Capacity 750 KL); (vi) Laying of approx. 26.83 km (Remodelling 8.95 km + Expansion 17.88 km) distribution network; and (vii) Installation of Bulk Flow meter and consumer meters.

Amarpur town - The sub project at Amarpur NP will cover only remodelling of distribution network of approx. 1.1 km length and expansion of approx.9.37 km water distribution at newly expanded area with installation of bulk water meter and domestic consumer meter.

Bishramganj town - Subproject includes the following: (i) Installation of pump and pump house for 6 nos. Deep Tube Well (DTW) at 6 different locations which are already sunk by DWS, (ii) Construction of 3 nos. Iron Removal Plant (IRP) near OHSR, (iii) Construction of 3 nos. OHSR, one number 300 KL capacity Near CSC District Manager office, one number 200 KL capacity OHSR at Purba Barjala and one number of 250 KL capacity OHSR at Chesrimai-I (iv) laying of approx. 5.507 km clear water transmission main, (v) laying of Approx. 39.172 km (5.606 km

remodelling & 33.566 km expansion) water distribution pipeline and (vi) installation bulk flow meter & consumer meter.

Melaghar town - Subproject includes the following: (i) Construction of 1 no RCC OHT of 450 KL, (ii) laying of Clear Water Transmission Main of approx. 2.0 Km (CWTM), (iii) laying of Approx. 15.668 km (5.787 km remodelling & 9.882 km expansion) water distribution pipeline and (iv) installation of bulk flow meter and consumer meter.

Belonia Town- Subproject includes the following: (i) Construction of Deep Tube Well (DTW) and Iron Removal Plant (IRP) at 5 locations, (ii) construction of OHSR 300 KL and 400 KL near All India Radio ward no. 16 and near Nightangle shelter house ward no.12, respectively, (iii) laying of approx. 4.3 km DI K9 pipe clear water transmission man and (iv) laying of Approx. 19.43 km new (only expansion) water distribution pipeline and (v) installation bulk flow meter and consumer meter.

Screening and Categorization. assessment of potential impacts. Water Supply subproject of these towns is classified as environmental category B as per ADB's Safeguard Policy Statement (SPS), 2009, and accordingly this initial environmental examination (IEE) assesses the environmental impacts and provides mitigation and monitoring measures to ensure that there are no significant impacts as a result of the subproject. As per the Government of India environmental impact assessment (EIA) Notification, 2006, this subproject does not require EIA study or environmental clearance. During the construction phase, subproject will require permission from respective road agencies (for those roads that are not under the jurisdiction of ULB), this will be obtained prior to start of construction. Similarly, in case works require shifting of utilities such as telephone and electricity lines, permission from respective agencies will be obtained.

Description of the Environment. The subproject towns Udaipur, Amarpur, Melagahr, Bishramganj and Belonia are in Tripura, Northeast India. It is bordered by Assam and Mizoram to the east and by Bangladesh to the north, south and west. Agartala is the capital and the largest city in the state. The whole of northeast India, including Tripura, falls under seismic zone V and is highly vulnerable to earthquakes. Proposed project components are located in urban areas with no nearby protected areas except in Melagarh, where a Ramsar weltand (Rudrasagar) is located within the municipal boundary, and in Udaipur town, where there are two protected monuments (temples). None of the project components are located within these sites.

Udaipur is headquarter of Gomati district in western Tripura. Located at 23.53°N and 91.48°E. Town is mostly covered by undulating hilly land, although there are some plain lands here and there has an average elevation of 22 meters. Area of town is 6.10 sq. km is divided into 23 wards, and has a population of 32,758 (2011 census). Annual rainfall in Gomati district was 1686.8 to 2855.8 between 2013 to 2018. The biggest river of the state, Gomati is passing besides the town. Intake structure and approach bridge are proposed on River Gomati, WTP at Banduar, 2 OHSR are proposed at Bhagini Nibedita School campus, and at Ramesh School campus Water pipes will be laid along the existing town roads. Nearest forest to Udaipur is Radhakishorepur Reserve Forest located 5 km from town. Within the Udaipur town there are two archaeological survey of India (ASI) protected monuments, Gunavati Group of Temples and Chaturdasa Devata temple are located at Radhakishorepur area, domestic water supply pipelines are proposed for the habitants about 57 m from the Chaturdasha Devta temple and 38 m from Gunavati group of temple near ASI site.

Amarpur: Amarpur nagar panchayat in Gomati District in the central part of Tripura. Located at 23.53°N and 91.64°E and Amarpur have an average elevation of 24 m above MSL. Amarpur lies

within low-laying alluvial plane of Gomati River & surrounded by high hilly terrane from all sides. Area of the town is 3.4 sq. km divided into 13 wards and population is 10,838 (2011 census). Situated at bank of Gomati River. Annual rainfall in Gomati district is 1686.8 to 2855.8 between 2013 to 2018. Only water supply pipelines are proposed in town and will be laid along the existing town roads. Nearest forest to Amarpur is Paschim Kalajhari Reserve Forest located 10 km, nearest protected area Gumti Wildlife Sanctuary, located at 19 km from the town. Two historical lakes Amarsagar and Fatiksagar are located at Amarpur. Chabimura is known for its panels of rock carving on the steep mountain wall on the bank of river Gomati is at 8 km from Amarpur.

Bishramganj is a newly constituted Village Panchayat comprising of 3 Gram Panchayats namely Bishramganj, Barjala and Chesrimai situated in Sepahijala district at 23.6128° N and 91. 4003° E at western Tripura. The Bishramganj is predominantly plain area with undulating landscape towards the outskirts of the town. The town has an average elevation of 8 m above MSL(with highest elevation being 15 m above MSL). Town area is 8 sq. km divided into 8 wards. Population is 11727 (2011 census). Annual rainfall in Sepahijala district is 1510.3 to 2935.3 between 2013 to 2018. Department of water supply has already sunk 6 DTW in different parts of town, installation of pump and pump house with 3 IRPs is considered in this project, 3. OHSR are proposed Near CSC District Manager office, at Purba Barjala and at Chesrimai-I, water pipes will be laid along the existing town roads. Nearest protected area to Bishramganj is Sepahijala wildlife sanctuary, located within 5.9 km from the town in Bishalgarh Development Block

Melaghar is located in Sipahijala district at 23.49°N and 91.33°E in western Tripura. Area of town is 17.99 sq. km divided into 13 wards and has population of 12379 (2011 census). Situated near river Gomati, Annual rainfall in Sepahijala district is 1510.3 to 2935.3 mm between 2013 to 2018. Melaghar is mostly covered by undulating hilly land, although there are some plain lands here and there. One OHSR is proposed near Radhamadhabpur JB School – Ward no 1. Water pipes will be laid along the existing town roads. Rudrasagar Ramsar protected wetland is within the municipal boundary of Melaghar town and water supply pipelines are proposed for the nearby household about 46 m from wetland.

Belonia town is in South Tripura District located at 23.25°N and 91.45°E in southern Tripua. Town is on Bank of Muhuri river Average elevation of Belonia is 23 m. The district is divided into two parts, Anticlinal Hill Ranges and Synclinal flat-bottomed valleys. The major hill ranges are Baramura and Atharamura. Town area is 5.76 sq. km divided into 17 wards. Population is 10060 (2011 census). Annual rainfall in South Tripua district is 1841.2 to 3228.2 between 2011 to 2018. Construction of DTW and IRPs are proposed at 5 locations in town, OHSR are proposed near All India Radio ward no. 16 and near Nightangle shelter house ward no.12, respectively. Water pipes will be laid along the existing town roads. Nearest protected area to Belonia are Rajbari National Park and Trishna Wildlife Sanctuary, located about 7.3 km and 9.5 km respectively from the town in South Tripura & Sepahijala District.

Potential Environmental Impacts and Mitigation measures. Environmental impacts due to the project design or location are not significant as various measures are already included in site planning and preliminary design. Augmentation of water source is proposed in 3 towns (one surface water and two groundwater) and remaining existing water sources will be utilized.. Assessment confirms the ground water and surface water source sustainability to provide required water, and Water Resources Investigation Division (WRID) has provided permission for ground water extraction for 2 towns and allotted surface water for 1 town. There are two protected monuments in Udaipur (Chaturdasha Devata Temple and Gunavati group of temples), and Rudrasagar lake, a Ramsar notified wetland, in Melaghar. These are located within the urban areas, however, none of the components are in the protected sites. Except water distribution lines

(90-150 mm diameter), which are located at about 40-50 m from the boundary of protected areas, none of the components like intake, service reservoirs or WTP is located close to these sites. Since pipes of small diameter, and will be buried underground, no notable impacts envisaged. Measures proposed for implementation and compliance to control dust, noise, silt-laden / contaminated runoff from construction sites, etc. along with scheduling of activities and not locating construction facilities close to the protected areas.

Potential impacts during construction are considered significant but temporary and are common impacts of construction in urban areas, and there are well developed methods to mitigate the same. WTP, Intake, Tube wells, IRP and OHSR construction activities will be confined to the selected sites, while pipe works will be along the public roads. Construction impacts arise mainly from dust and noise, hauling of construction material, waste, and equipment on local roads (traffic, dust, safety etc.), mining of construction material, occupational health, and safety (OHS) aspects. Pipe laying works in roads congested with people, activities, and traffic may have impacts arising mainly from the disturbance of residents, businesses, and traffic due to construction work; safety risk to workers, public and nearby buildings due to deep trench excavations in the road; access impediment to houses and business, disposal of large quantities of construction waste etc. Trenchless method will be adopted for water supply where required such as at main road crossings in traffic areas.

The project will utilize existing surface water-based system, including the water treatment plant (WTP), to meet part of the water demand. Preliminary audit of WTPs conducted during the IEE indicate no legal non-compliance, however, suggests improvements such as backwash and sludge management systems, chemical storage/handling etc., Detailed technical assessment will be conducted by DBO contractor during the detailed design, and PMU will ensure that necessary improvements are taken up by Drinking water & sanitation (DWS), PwD.

Environmental Management. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels, along with the delegation of responsibility to appropriate agency. Various design related measures are already included in the project design. During construction, the EMP includes mitigation measures such as (i) proper planning and scheduling of water line works to minimize public inconvenience; (ii) measures to avoid impacts on heritage building and chance find procedures; (iii) measures to avoid any impacts on archeological protected monuments and Ramsar protected lake; (iv) barricading, dust suppression and noise control measures; (v) traffic management measures for works along the roads and for hauling activities; (vi) occupational and community health and safety, labour welfare, (vii) provision of walkways and planks over trenches to ensure access will not be impeded; (viii) reuse of excavated materials to extent possible, (ix) spill and sediment control measures to avoid water and soil pollution, etc.

EMP will guide the environmentally-sound construction of the subproject. EMP includes a monitoring program to measure the effectiveness of EMP implementation and include observations on- and off-site, document checks, and interviews with workers and beneficiaries. A copy of the updated EMP/ site environmental management plan (SEMP) shall be always kept on-site during the construction period. The EMP will be included in BID and contracts, and implementation shall be binding on contractors.

Implementation Arrangements. Urban Development Department (UDD) of Government of Tripura (GOT) is the executing agency, and the implementing agencies are Tripura Urban Planning and Development Authority (TUDA, for urban component) and Tripura Tourism Development Corporation Limited (TTDCL, for tourism component). A project management unit

(PMU) in Agartala and six project implementation units (PIUs, 3 urban and 3 tourism) will be established in Agartala, Udaipur and Kumarghat. Project management and supervision consultant (PMSC) will be engaged to assist PMU and the PIUs. At PMU, the project coordinator will be the nodal officer for environmental, social safeguards and gender and will be responsible for ensuring compliance with ADB's Safeguards Policy Statement (SPS), 2009. An environmental safeguards officer (ESO) will be engaged to support the project coordinator. Project manager or assistant project manager of PIU will be designated as safeguards focal in each PIU. PMSC team will include an Environmental Safeguards Specialist (ESS), and three support safeguards staff located in PIUs. Contractor will appoint an Environment, Health and Safety (EHS) supervisor.

Consultation, Disclosure and Grievance Redress. The stakeholders were involved in developing the IEE through FGD and public consultation at project area level, after which views expressed were incorporated into the IEE and in the planning and development of the project. Focus Group Discussion (FGD) has also been carried out at different locations (wards) of the project area. The stakeholders were involved in developing the IEE through FGD and public consultation at project area level, after which views expressed were incorporated into the IEE and in the planning and development of the project. FGDs and consultations have been conducted in all the five towns: **Udaipur** – September, November 2021, January, March 2022, March 2023 with 210 participants (78 male and 132 female). **Amarpur** – November & December 2021, March, July, and August 2022 with 101 participants (56 male and 45 female). **Bishramganj** – January 2022 February 2022, March 2022, April 2022, September 2022, October 2022 and November 2022 with 78 participants (30 male and 48 female). **Melaghar** – March 2022, November 2022, March 2023 with 92 participants (54 male and 38 female). **Belonia**- November 2021, January, February, and March 2022 with 122 participants (95 male and 27 female). All participants are expressed need for the project and willingness to take it up and stakeholders were very supportive for the project and promises to extend full cooperation during the construction phase as the activities are proposed to improve the water supply service levels and the living standards.

Monitoring and Reporting. The PMU, PIU and consultants will be responsible for monitoring and reporting. During construction, results from internal monitoring by the DBO contractor will be reflected in their monthly EMP implementation reports to the PIU. PIU with the assistance of PMSC, will monitor the compliance of contractor, prepare a quarterly environmental monitoring report (QEMR) and submit to PMU. The PMU will oversee the implementation and compliance and will submit semi-annual environmental monitoring reports (SEMR) to ADB. SEMRs will be disclosed on ADB and project websites.

Conclusions. The proposed project is unlikely to cause significant adverse impacts, and potential impacts are mainly due to construction and can be mitigated or minimized to acceptable levels through measures included in the EMP. The citizens of the Udaipur, Amarpur, Bishramganj, Melaghar and Belonia will be the major beneficiaries. The subproject is primarily designed to improve environmental quality and living conditions of these towns through provision of water supply. The benefits arising from this subproject include:(i) increased availability of potable water to all households including urban poor; (ii) reduced time and costs in accessing alternative sources of water; (iii) better public health particularly reduction in waterborne and infectious diseases and (iv) reduced risk of contamination of treated water supplies. Based on the findings of the IEE, the classification of the project as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009) or GoI EIA Notification (2006). Existing WTPs require some improvements, these need to be taken up after detailed assessment part of detailed design. This IEE needs to be updated during the detailed design, reviewed, and approved by ADB, and to be disclosed prior to start of construction.

I. INTRODUCTION

A. Tripura Urban and Tourism Development Project (TUTDP)

1. The project is aligned with the following impact(s): clean and sustainable environment in ULBs achieved, and Tripura increasingly recognized in the India tourism industry as a new destination.[1] The project will have the following outcome: Adequate, safe, and climate- and disaster-resilient, urban services (water, storm drainage, and municipal roads) provided and sustainable tourism improved in project areas.[2]

2. **Output 1: Municipal reforms and capacity of ULBs strengthened.** The project will strengthen (i) the capacity of technical staff in project management and operation and maintenance (O&M) of urban infrastructure; (ii) ULB own-source revenue generation, financial management and accounting reforms; (iii) advisory support for city-wide inclusive sanitation for ULBs that complements government financing scheme;[3] (iv) integration of climate change- and disaster resilience in urban planning with universal design consideration, and gender equality and social inclusion (GESI) analysis and (v) support to developing building regulations and building byelaws for the state.

3. **Output 2: Urban infrastructure improved.** The project will improve various public infrastructures, such as (i) water supply, (ii) stormwater drainage, and (iii) municipal roads.

4. **Output 3: Tourist destinations improved.** The project will strengthen public infrastructure that is vital for ecotourism such as (i) tourism destination development with climate resiliency and green infrastructure retrofitting; (ii) museum development at the Neermahal Palace (iii) Improved tourist accommodation and family oriented-Adventure Park; and (iv) Tourism-related goods and equipment for selected tourism destinations.

5. **Output 4: Capacity of tourism development corporation's operational services improved**. Tripura tourism through TTDCL will (i) develop a 10-year business plan including marketing and coordination with the private sector (including exploring outsourcing and O&M of tourism facilities and assets for local business, small and medium enterprise opportunities for women), (ii) demonstrating community-based tourism development (iii) stakeholder tourism capacity and skill development program, (iv) marketing and tourism promotion activities.

6. Under phase 1 of the project, 12 towns have been selected for improvement of Water Supply, Sewerage & Septage Management, Developments of Drains & Roadside Drains and Urban Transport. Tripura Urban and Tourism Development Project (TUTDP) will be implemented over a 5-year period. Udaipur, Belonia, Amarpur, Bishramganj and Melaghar are five project towns in this package (Package WS/02), improvement of water supply system in these five towns are proposed under the TUTDP.

7. Urban Development Department (UDD) of Government of Tripura is the executing agency. A Project Management Unit (PMU) is established under UDD, and jointly represented by the IAs of TUDA and Tripura Tourism Development Corporation Limited (TTDCL).

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[1] Government of India, Ministry of Housing and Urban Affairs. 2015. Smart Cities Mission Guidelines. Delhi; Government of Tripura, Department of Tourism. 2020. Tourism Policy 2020–2025. Agartala.

[2] The design and monitoring framework is in Appendix 1.

[3] ADB is working with Global Water and Sanitation Center under Bill and Melinda Gates Foundation to provide CWIS support preliminary study for 2 towns that would be potentially financed in the planned Phase 2.

B. Purpose of Initial Environmental Examination Report

8. As per ADB's Safeguards Policy Statement, 2009, ADB requires the consideration of environmental issues in all aspects of the Bank's operations. Using rapid environmental assessment (REA) checklist (Error! Reference source not found.***)***, subproject is unlikely to cause significant adverse impacts, and classified as category B and per ADB SPS requirements this IEE is conducted.

C. Scope of IEE

9. The subproject will be implemented under the design-build-operate (DBO) modality. Thus, this IEE is based on the preliminary project design report. The IEE is conducted mainly based on field reconnaissance surveys and secondary sources of information. Stakeholder consultation was an integral part of the IEE. This IEE will be updated during the detailed design to reflect changes and submitted to ADB for approval. IEE will be further updated during implementation if there are any changes in project scope, design or sites updates will supersede the earlier version.

D. Report Structure

10. This Report contains the following sections:

(i) Executive summary;
(ii) Introduction;
(iii) Description of the project;
(iv) Analysis of alternatives;
(v) Policy, legal and administrative framework;
(vi) Description of the environment;
(vii) Anticipated environmental impacts and mitigation measures;
(viii) Public consultation and information disclosure;
(ix) Grievance redress mechanism;
(x) Environmental management plan; and
(xi) Conclusions and recommendations.

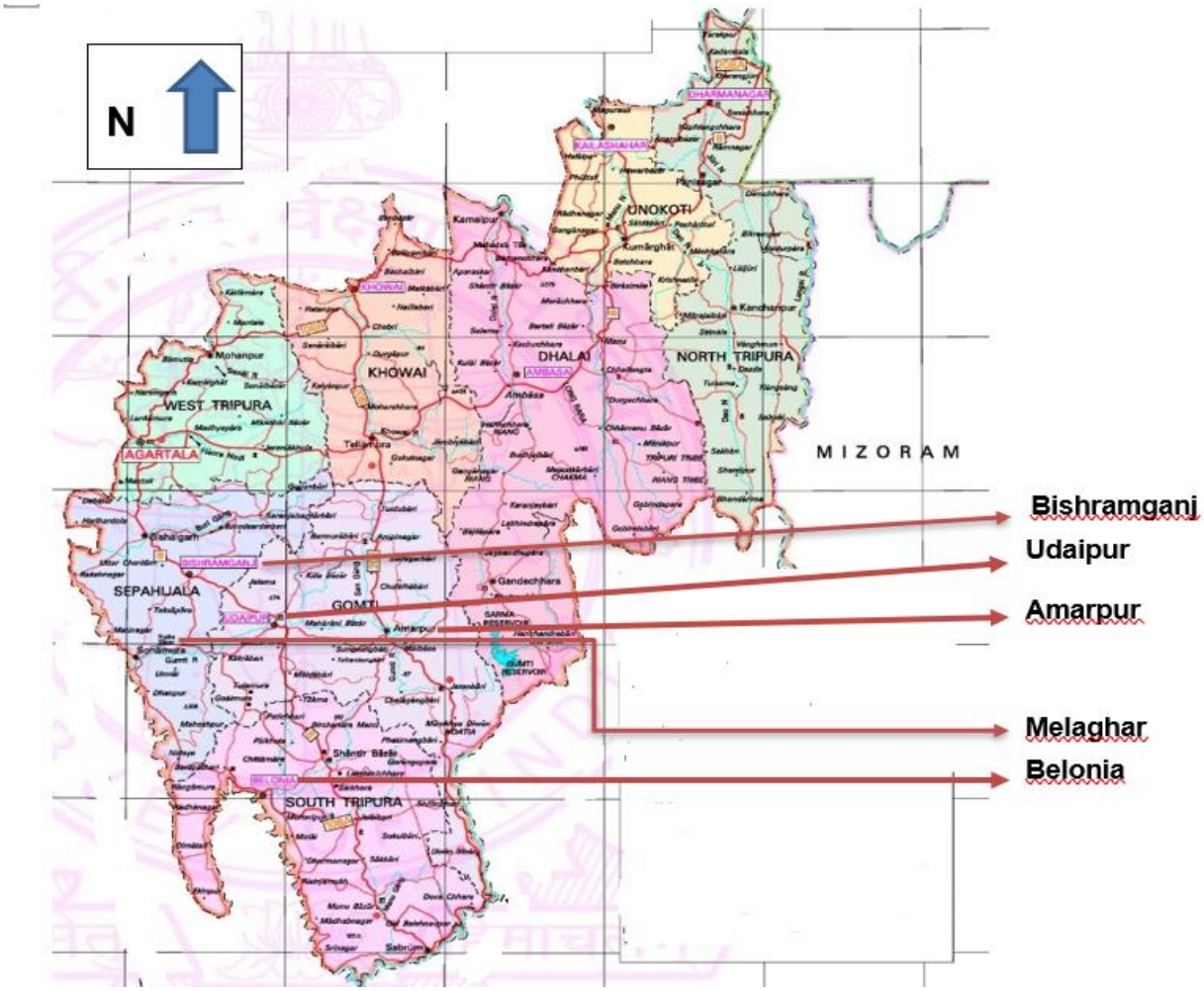
II. DESCRIPTION OF THE PROJECT

A. Project Location

11. Project towns Udaipur, Aparpur, Bishramganj, Melagahr and Belonia are located in Tripura state in northeast India. It is bordered by Assam and Mizoram to the east and by Bangladesh to the north, south and west. Agartala is the capital and the largest city in the state. **Udaipur** is a town located at 23.53°N and 91.48°E and is about 53 km from Agartala. Town area is 6.10 sq. km divided into 23 wards. The population is 32,758 (2011 census). **Amarpur** is a town located at 23.53°N and 91.64°E and is about 77 km from Agartala. Town area is 3.4 sq. km divided into 13 wards. The population is 10,838 (2011 census). **Bishramganj** is a newly constituted Village Panchayat comprising of 3 Gram Panchayats namely Bishramganj, Barjala and Chesrimai. is located at 23.6128° N and 91. 4003° E and is about 28 km from Agartala. Town area is 8 sq. km divided into 8 wards. The population is 11727 (2011 census). **Melaghar** is a town located at 23.49°N and 91.33°E and is about 50 km from Agartala. Town area is 17.99 sq. km divided into 13 wards. The population is 12379 (2011 census). **Belonia** is a town located

at 23.2505° N and 91.4676° E. and is about 90 km from Agartala. Town area is 5.76 sq. km divided into 17 wards. The population is 10060 (2011 census). Figure 1 presents the location of subproject towns.

Figure 1: Geographical Location of Subproject towns on State map of Tripura



Source - https://surveyofindia.gov.in

B. Existing Water Supply Situation

12. **Udaipur.** The present water supply to the town is from Gomati River (intake well) and ground water (deep tube wells). Surface is treated in water treatment plant. Groundwater has high iron content, iron removal plants (IRP) provided near working tube well. The distribution system covers about 52.6 % of the population, and supply rate of 57.7lpcd, supply frequency of 5 hours every day. Details of the existing system is given in Table 1 and service level benchmarks in Table 2.

13. **Amarpur.** The present water supply to the town is from Gomati River (intake well) and ground water (one deep tube well). Surface is treated in water treatment plant. The distribution system covers about 91% of the population, and supply rate of 113 lpcd, supply frequency of 4-

6 hours every day. Details of the existing system is given in Table 1 and service level benchmarks in Table 2.

14. **Bishramganj.** Present water supply to the town ground water (deep tube wells). Groundwater has high iron content, iron removal plants (IRP) provided near working tube well. The distribution system covers about 73% of the population, and supply rate of 60 lpcd, supply frequency of 4 hours every day. Details of the existing system is given in Table 1 and service level benchmarks in Table 2.

15. **Melaghar.** The present water supply to the town is from Gomati River (intake well) and ground water (deep tube wells). Surface is treated in water treatment plant. The distribution system covers about 35% of the population, and supply rate of 109 lpcd, supply frequency of 3 hours every day. Details of the existing system is given in Table 1 and service level benchmarks in Table 2.

16. **Belonia.** The present water supply to the town is from Muhuri River (intake well) and ground water (deep tube wells). Surface is treated in water treatment plant. Groundwater has high iron content, iron removal plants (IRP) provided near working tube well. The distribution system covers about 51.3 % of the population, and supply rate of 117 lpcd, supply frequency of 4-6 hours every day. Details of the existing system is given in Table 1 and service level benchmarks in Table 2.

Table 1: Summary of Existing Compoents in subproject towns

Component	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
Source - Ground water	10 DTWs-1.57 MLD	2 DTW -0.28 MLD	9 DTWs– 2.1 MLD	8 DTWs – 0.43 MLD	4 DTWs – 0.82 MLD
Surface water Source	4.72 MLD -Gomati River	2.95 MLD - Gomati River	-	4.7 MLD - Gomati River	4.54 MLD-Muhuri River
Total water production	6.29 MLD	3.23 MLD	2.1 MLD	5.13 MLD	5.36 MLD
Intake	• Diameter: 5 m • Depth: 15 m • Capacity: 5.9 MLD capacity • Pump Capacity: VT Pump of 50 HP Capacity each: 3 nos. • Pump Type: Vertical turbine centrifugal pump • Commissioning year: 1997	• Diameter: 5 m • Depth: 15 m • Capacity: 2.95 MLD • Pump Capacity: 50HP VT Pump= 2no, 50HP Centrifugal pump= 1 no • Pump Type: Vertical turbine centrifugal pump • Commissioning year: 2007	-	• Diameter: 9.5 m • Depth: 12 m • Capacity: 4.77 MLD • Pump Capacity: 3 nos.' (1W+2S) @ 60000 GPH/ 272.8 cum/hr each • Pump Type: Vertical turbine centrifugal pump • Commissioning year: 2011 Located at Sarkar Tilla, Melaghar	• Diameter: 5 m • Depth: 12 m • Capacity: 4.54 MLD • Pump Capacity: VT Pump of 75 HP Capacity each: 2 nos. • VT Pump of 60 HP Capacity each: 2 nos. • Pump Type: Vertical turbine centrifugal pump • Commissioning year: 2002
Raw water Transmission main - Transport of raw water from intake to Water Treatment Plant	400 mm diameter CI pipe of 400 m length.	300 mm diameter DI pipe of 350 m length	-	300 mm diameter DI K-9 pipe of 300 m length,	200 mm diameter DI K-9 pipe of 200 m length,
Iron Removal plant for deep tube wells	10 nos. of Deep Tube well (DTW), 3 nos. are functional with one having Iron Removal Plant (IRP).	2 nos. deep Tube Wells with no IRP.	4 nos. IRP, but due to lack of maintenance, these IRPs are non-functional	no IRP for the existing DTW.	5 nos. of IRP, four IRPs are still working, and one is non-functional.

Component	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
Water Treatment plant (WTP) **- Treatment of Raw water before storage and distribution**	• Capacity: 1.3 MGD ~ 5.9 MLD • Treatment Unit: Cascade aerator, Flash Mixer, Clariflocculator, Rapid sand filter, Chlorination and Clear water reservoir • Commissioning year: 1997	• Capacity: 0.65 MGD ~ 2.95 MLD • Utilized capacity: 2.95 MLD • Treatment Unit: Cascade aerator, Flash Mixer, Clariflocculator, Rapid sand filter, Chlorination and Clear water reservoir • Commissioning year: 2007	-	• Installed Capacity: 1.05 MGD (4.77 MLD) • Treatment Unit: Aeration Tank, Cascade aerator, Flash Mixer, Clariflocculator, Rapid sand filter, Chlorination and Clear water reservoir • Year of Construction: 2011 • Treatment Process: Conventional	• Installed Capacity: 4.54 MLD • Treatment Unit: Aeration Tank, Cascade aerator, Flash Mixer, Clariflocculator, Rapid sand filter, Chlorination and Clear water reservoir • Year of Construction: 2002 • Treatment Process: Conventional
Clear water reservoir (CWR) - Storage of treated water within WTP	-	Capacity – 454.54 m^3 (1 Lakh gallon) Commissioning year: 2007 Pumps – (2W+1S)	-	Capacity – 454.54 m^3 Commissioning year: 2011 Pumps – (1 W + 2 S)	-
Clear water Transmission main **- Transport of treated water from WTP to water storage reservoirs**	• Diameter in MM – 200-400 • Type - DI • Commissioning year - 2003 • Length in m- 5425 m	• Diameter in MM – 200 mm dia DI K9, 2000 m length and 300 mm dia DI K9, 100 m length • Type – DI K9 • Commissioning year - 2007 • Length in m- - 2100	-	300mm Dia DI pipe-1395 m	200mm Dia DI pipe-7000 m
Overhead Water Storage Reservoir	There are 4 OHTs out of these 3 OHTs are of RCC and found in acceptable condition	2 nos. Location and capacity in KL • Sankarpalli – 567	At present, there is no overhead service reservoir or underground reservoir	Location and capacity in KL 2 nos. Location. • Goru Bazar – 454	4 RCC based OHTs out of these 4 OHTs 3 OHTs which are at Netaji Palli,

<table>
<tr><th>Component</th><th>Udaipur</th><th>Amarpur</th><th>Bishramganj</th><th>Melaghar</th><th>Belonia</th></tr>
<tr><td>- Storage of treated water for distribution</td><td>for future use and 1 No. of OHT Near the office of the Executive Engineer (DWS) is of Steel frame structure (Rectangular) which is in dilapidated condition
• 1 OHR 681 KL- Udaipur Electrical subdivision office (Below Jagannath dighi)
• 681 KL - Near Udaipur Rajabag Bus Stop
• 1.5 Lakh Gallon - Near Drinking Water Supply sub division office</td><td>• Chandipara - 380</td><td>under Bishramganj Village Panchayat</td><td>• High School -454</td><td>Belonia division hospital and Belonia college ground found in acceptable condition for future use and 1 Nos. of OHT near DM office is currently in inadequate condition</td></tr>
<tr><td>Distribution network
- Supply of treated water to households</td><td>80 km (DI, CI and uPVC Pipes)</td><td>DI, CI and uPVC - 27.518 km
Details of the distribution line is not available</td><td><table><tr><th>Diameter In Mm</th><th>Type of Pipe</th><th>Length In M</th></tr><tr><td>50</td><td>uPVC</td><td>1,872</td></tr><tr><td>90</td><td>uPVC</td><td>5,824</td></tr><tr><td>110</td><td>uPVC</td><td>1,835</td></tr><tr><td>125</td><td>uPVC</td><td>1,465</td></tr><tr><td>140</td><td>uPVC</td><td>5,479</td></tr><tr><td>150</td><td>DI</td><td>5,264</td></tr><tr><td>200</td><td>DI</td><td>141</td></tr><tr><td colspan="2">Total</td><td>21880</td></tr></table></td><td>110mm dia- uPVC- 36.56 Km
160mm Dia uPVC- 7.32 Km</td><td>Existing uPVC, DI and CI= 23.810 km</td></tr>
<tr><td>House Service connection</td><td>6,036 domestic water connections and 6 nos. of street hydrant points.</td><td>1,900 domestic water connections and 45 street hydrant points</td><td>2200 number of households connection</td><td>1718 number of households connection</td><td>3431 number of households connection</td></tr>
</table>

Source: Town DPRs

Table 2: Service Level Benchmark Status for Existing Water Supply for the towns

Service level indicators	Benchmarks	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
Coverage of water supply (%)	100	52.6	90.96	73	34.64	51.3
Per capita supply of water (lpcd)	135	57.7	113	60	109	117
Extent of metering of water connection (%)	100	0	0	0	0	0
Extent of non-revenue water (%)	20	20-30	30	30	50	60-70
Continuity of water supply (hours)	24	5	4-8	4	3	4-6
Quality of water supplied (%)	100	NA	Acceptable as per IS 10500-2012	100	Data not available	80
Efficiency in redressal of customer Complaints (%)	80	NA	NA	NA	Data not available	NA[4]
Cost recovery in water supply services (%)	100	20 -30	21	20-30	13	20 to 30
Efficiency in collection of water related Charges (%)	90	60-70	60-80	50-60	Data not available	60 to 70

Source: Town DPRs

C. Proposed Water Supply components

17. The objective of the proposed water supply scheme is to provide 24 x 7 water supply to the towns with sufficient pressure and minimum losses.

18. **Udaipur.** For filling up the demand gap of 12 MLD, New intake at river Gomati, WTP and CWR, are proposed under the project. 2 new OHSR near Bhagini Nibedita School campus and near Ramesh School campus are proposed. 26.83 km long distribution network is proposed to cover maximum area of town (8.951 km is remodeling of existing network and the balance 17.88 km is for expansion). Raw water mains will be laid from new intake to new WTP, Clear water transmission mains from WTP to storage reservoirs will be laid.

[4] NA: Not Assessed

19. **Amarpur**. No new sources are proposed under this project. 10.47 km long distribution network is proposed to cover maximum area of town (9.37 km is for expansion and balance 1.2 km is remodeling of existing network).

20. **Bishramganj**. For filling up the demand gap of 0.86 MLD, Installation of pump and pump house for 6 nos. Deep Tube Well (DTW) at 6 different locations which are already sunk by DWS, with three IRPs, are proposed under the project. For storage of additional water three new OHSR has been proposed at Chesrimai-I, Purba Barjal and CSC District Manager, Sepahijala 39.17 km long distribution network is proposed to cover maximum area of town (5.60 km is remodeling of existing network and the balance 33.56 km is for expansion). Transmission mains of 5.5 km will be laid from IRPs to OHTs.

21. **Melaghar**. No new source is proposed under this project. For storage of additional water one OHSR has been proposed near near Radhamadhabpur JB School – Ward no 1. 15.66 km long distribution network is proposed to cover maximum area of town (5.7 km is remodeling of existing network and the balance 9.88 km is for expansion). 2 km Transmission mains will be laid new OHSR.

22. **Belonia**. For filling up the demand gap of 2.74 MLD, 5 new DTWs, with IRPs, are proposed under the project. 2 new OHSR near Nightangle shelter house and near All India Radio Station has been proposed. The whole municipal area will be divided into 5 Zones, 2 zones will be served by new proposed DTWs and remaining 3 zones by existing 4.54 MLD WTP. 19.43 km long distribution network is proposed to cover new areas of town. Transmission mains will be laid for new IRP to OHSRs.

The site selected for DWT -3 has an existing concrete septic tank which is not in use from past one and half years. In this area sandy loam and clayey loam soil are available and this soil has moderate permeability. The distance between the septic tank and proposed DWT to be kept minimum 25- 30 m. the space is available in selected site and DBO contractor will selected the site during SIP period.

D. Source Sustainability

23. **Surface water Source**. The existing river-based systems in four the towns consisting of river intake, transmission and WTP will be continued to use in the future, and the water abstraction and treatment capacity will remain the same. The existing sources are sustainable with sufficient water availability in river.

24. **Udaipur.** Water demand for Udaipur town has been calculated based on 135 LPCD as per CPHEEO norms. Base year, intermediate year and ultimate year is estimated as 9.00 MLD (2023), 12.05 MLD (2038) and 16.30 MLD (2053). Existing WTP production will be continued to supply, an additional Intake of 12 MLD capacity along with new WTP on river Gomati is proposed. As per Water Resources Investigation Department (WRID) more than the required surface water is available in the river throughout the year and permission for withdrawal of 19.1 MLD water is accorded (Appendix 13).

25. **Ground water Source.** Groundwater is proposed in Bishramganj, and Bilonia, to meet the demand-supply gap of 2038. Joint meetings have been held between Urban Development Authority, DWS, Water resources Investigation Division and PDMC team for assessing water availability and obtaining approval of Ground water withdrawal. An approval letter Vide memo no. F.1(40)/EE/WRID/TECH/2020/58-60 has been provided by Water resources Investigation

Division, Agartala along.

26. **Bishramganj.** Water demand for Bishramganj town has been calculated based on 135 LPCD as per CPHEEO norms. Base year, intermediate year and ultimate year is estimated as 2.50 MLD (2023), 3.00 MLD (2038) and 3.49 MLD (2053) respectively. Since present tube wells will not be used new pump and pump house will be installed for 6 new DTWs which are already sunk by DWS. Total production will be 4.34 MLD from new DTWs. As per Appendix 13 the available ground water yield of Bishramganj town ranges from 50-100 m^3/hr. The proposed 6 tube wells may withdraw water considering sustainable discharge with 60% safety.

27. **Belonia:** Base year, intermediate year and ultimate year water demand is estimated as 4.61 MLD (2023), 5.82 MLD (2038) and 7.06 MLD for 2053 respectively for Belonia town. Existing WTP production will be continued and to meet the gap in supply of 2.74 MLD. Since present tube wells will be not used, 5 new DTWs have been proposed to meet 2053 demand (7.06 MLD). The available ground water yield of Belonia town ranges from 50-100 m^3/hr. Therefore, it is proposed that the new tube wells may withdraw water considering sustainable discharge with 50% safety.

28. No new sources are proposed in Melagahr and Amarpur town in this project and existing surface and ground water source will be continued.

29. Summary of proposed water supply components is shown in Table 3.

Table 3: Summary of Proposed water supply Components

Particulate	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
Population					
Commissioning Year (2023)	49009	12791	12846	21354	22876
Intermediate year (2038)	62431	15888	15702	26955	29187
Design year (2053)	85365	19015	18543	32693	35718
Water Demand in MLD					
Commissioning Year (2023)	9.00	2.59	2.50	3.82	4.61
Intermediate year (2038)	12.05	3.16	3.00	4.75	5.82
Design year (2053)	16.30	3.73	3.49	5.71	7.06
Source					
Source available (MLD)	Ground Water (Existing) – 1.57 Gomati River (Existing) - 4.29	Ground Water (Existing) – 0.28 Gomati River (Existing)- 2.95	Ground Water (Existing) -2.14	Ground Water (Existing) – 0.43 2Gomati River (Existing) -4.7	Ground Water (Existing) - 0.82 Muhuri River (Existing) - 4.54
Selected Source (MLD)	Gomati River (Existing-4.29 & New-12) – 16.29 Ground Water (Existing) – 1.57 Total= 17.86	Gomati River (Existing) – 2.95 2.Ground Water- 0.28 (Existing) Total= 3.23 (No new source proposed)	Ground Water (New) – 4.34 – (Installation of pump and pump house for 6 nos. Deep Tube Well (DTW) at 6 different locations which are already sunk by DWS)	Ground Water (Existing) – 0.43 Gomati River (Existing) - 4.7 Total= 5.13 (No new source proposed)	Ground Water (New Deep Tube Well (DTW) and Iron Removal Plant (IRP) at 5 locations)) – 3.56 2. Muhuri River (Existing) -4.54 Total= 8.1
From source to consumer supply	Raw water abstraction from selected source (River / DTWs) → raw water transmission (pumping) → treatment → clear water transmission (pumping) → storage → distribution → house connections with meters				
Raw water source-intake – Pumping of Raw water from source	On Gomati River. RCC well with 7 m dia. 15 m depth from the floor level is proposed. **Capacity of the Intake- 12 MLD** Approach bridge - 30 m length 2 m width . Eastern part of the town at Ward 23., upstream of existing intake	No new intake	No new intake	No new intake	No new intake

Particulate	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
Tube wells	No new tube wells, existing Tube well will used in new system	No new tube wells, existing Tube well will be used in new system	• Bore well of 20,000 GPH/91 cum/hr, 10000 GPH/ 45.5 cum/hr, 7500 GPH/ 34.1 cum/hr, and 5000 GPH/ 22.7 cum/hr • Production capacity- 14-hour operation Submersible pump set for DMA-1 • 12-hour operation Submersible pump set for DMA-2 • 16-hour operation Submersible pump set for DMA-3 • Produced about 4.34 MLD • (Tube well already sunk only pump will be installed)	No new deep tube well proposed	Bore well of 10,000 GPH / 45.5 cum/hr. Production capacity in 8-hour operation pump set. 5 Deep Tube Wells (200 mm dia. with thickness of 5.40 mm 200 M depth) **To be produced about 3.56 MLD** • Deep Tube Well-1 beside Nightangle Shelter House. (Ward no. 12) • Deep Tube Well-2 inside the Ishwar Chandra Vidyasagar College/ICV campus (Ward no. 16) • Deep Tube Well-3 near Narayan Smriti Angonwadi Center & Giridhari Ashram (Ward no. 14) • Deep Tube Well-4 near DM office (Ward no. 15) • Deep tube well-5 near Satmura S.B. School/ All India Radio (Ward no. 16)
Raw water Transmission main (RWTM) - Transport of raw water from intake to Water Treatment Plant	Approx. 837 m – 400 mm dia. DI K9 pipe From proposed Intake to proposed WTP	No RWTM proposed for this project.	- No RWTM proposed for this project.	No new RWTM proposed for this project.	- No RWTM proposed for this project.
Iron Removal plant for deep tube wells	No new IRP	No new IRP	• 2 nos. @ 7500 GPH/34.1 cum/hr near DTW • 1 no. @ 5000 GPH/ 22.7 cum/hr near DTW	-	Construction of five, 10000 GPH/ 45.5 cum/hr Capacity IRP with DTW and pump house. Same DTW locations

Particulate	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
			At Jurpukur, Near Purba Barjala, Near Chesrimai-I		
Water Treatment plant (WTP) - Treatment of Raw water before storage and distribution	Construction of 7.6 MLD conventional WTP (first module). *WTP consists of Aeration unit, Pre-Chlorination, Alum Dosing, flash mixing, flocculation, laboratory, backwash water storage tank, Clarification, filtration, Post Chlorination, etc.* *Location* - eastern side of town on available Government land at Ward 23. The proposed WTP is located at which is 150 m away from the existing WTP.	No new WTP is proposed.	No new WTP is proposed.	No new WTP is proposed. Existing WTP will utilize.	No new WTP is proposed
Clear water reservoir (CWR) - Storage of treated water within WTP	10m dia x3.5 m side water depth, Pumps: Q: 180 m 3 /hr and H: 41 m (1W+1 S) Pump type: Horizontal Split Casing Centrifugal Pump Located within the WTP	Not proposed	Not proposed	Not proposed	Not proposed
Clear water Transmission main - Transport of treated water from WTP to water storage reservoirs	Gravity clear water transmission main – length -6.285 km. 400 mm dia. – DI K9 pipe= 2200 m 300 mm dia. - DI K9 pipe= 860 m 250 mm dia.- DI K9 pipe= 3225 m Retrofitting of pipes of 3.3 km is proposed. The clear water main proposed along existing local roads	Not Proposed	Gravity clear water transmission main length – 5.5 km. IRP to OHT is 5,507 m having 100 mm, 150 mm & 200 mm dia. The clear water main proposed along existing local roads	2000 m is new proposed having 200 mm diameter.	From the 5 numbers of DTW- IRP to 2 numbers OHSR. 4300 m length DI K9- 150 mm Dia.

Particulate	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
Construction of Overhead Water Storage Reservoir - Storage of treated water for distribution	2 no of Over Head Tanks (OHTs) with capacity of 900 KL and 700 KL are proposed under this scheme to supply water in each DMA. • OHSR 1: 900 KL – 24 m Staging height at Bhagini Nibedita School campus • OHSR 2: 750 KL- 18 m Staging height at Ramesh School campus	New reservoir is not considered in this project	There are three numbers of OHT proposed • OHT-1: capacity 250 KL (18 m Staging height), at Chesrimai-I • OHT-2: capacity 200 KL (18 m Staging height), at Purba Barjala • OHT-3: capacity 300 KL (18 m Staging height), at CSC District Manager, Sepahijala Tripura	OHT-1: capacity 450 KL (18 m Staging height), Designed for 30 years by considering the 12 hrs. water demand of the year 2038. Located near Radhamadhabpur JB School – Ward no 1	Storage of filtered water in 2 numbers of OHSRs OHSR-1: capacity 300KL (18 m Staging height), OHSR-2: capacity 400KL (18 m Staging height), • OHSR-1: near All India Radio Station which is located at south-eastern part of the town. • OHSR-2: near Nightangle shelter house which is located western part of the town.
Distribution network - Supply of treated water at households	Total distribution network – **Approx 26.831 km** **Proposed new distribution – 17.880 km** 125 mm dia HDPE PN-10= 3183 m (P) 140 mm dia HDPE PN-10= 4078 m (P) 160mm dia HDPE PN-10=598 m (P) 180mm dia HDPE PN-10= 6736 m (P) 225 mm dia HDPE PN-10= 1737 m (P) 250 mm dia HDPE PN-10 = 854 m (P) 300mm dia DIK9=423 m (P) 350mm dia DIK9=187m (P)4 400 mm dia DIK9=84 m (P) **Remodeling– 8.951 km** 140 mm dia HDPE PN-10= 409 m (RM) 180 mm dia HDPE PN-10= 1994 (RM) 225 mm dia HDPE PN-10= 2072 m (RM)	Total distribution network –**. 10.479 km** **New Pipeline-9.374 km and** **<u>New pipeline</u>** 110 HDPE mm dia. = 6104 m 160 mm HDPE dia. = 3270 m **<u>Remodeling of old pipeline</u>- 1.12 km)** 315 mm dia. = 167 m 250 mm dia.= 93 m 225 mm dia.= 338 m 160 mm dia. = 507 m Distribution pipes will be laid along the roads, within the road right of way of existing roads of town	Total distribution network –**. 39.172 km** length of 90-300 mm dia. HDPE/DI pipe New Pipeline- approx. 33.566 km Remodeling of old pipeline- approx. 5.606 km **New proposed- 33.566 km** 90mm Dia. HDPE – 26461 m 110 mm Dia. HDPE – 744 m 125 mm Dia. HDPE– 845 m 140 mm Dia. HDPE - 1284 m 160mm Dia. HDPE – 2034 m 18 mm Dia. HDPE – 1034 m 200 mm Dia. HDPE – 175 m 225 mm Dia. HDPE – 79 m 250mm Dia. HDPE- 724 m 250 mm Dia. DI K9- 78 m 300 mm Dia. DI K9 – 108 m **Remodeling – 5.606 km** 90 mm Dia. HDPE– 329 m 110 mm Dia HDPE- 232 m 160 mm Dia. HDPE – 115 m 180 mm Dia. HDPE – 566 m 200 mm Dia. HDPE- 759 m 225 mm Dia. HDPE –1806 m 250 mm Dia. HDPE –1666 m 250 mm Dia. DI K9 – 133 m	To distribute water in the Melaghar town approx. 15,668 km (5.786 km is Remodeling and 9.882 km is Expansion) **Proposed new – Total-pipeline 9.882 km** 90 mm Dia. HDPE– 8310 m 110 mm Dia. HDPE- 357 m 125 mm Dia. HDPE – 49 m 140 mm Dia. HDPE – 336 m 160 mm Dia. HDPE – 159 m 225 mm Dia. HDPE – 210 m 250 mm Dia. HDPE – 70 m 280 mm Dia. HDPE – 59 m 300 mm Dia. DI K7 – 332 m **Remodeling – Total-5.786 km**	To distribute water in the Belonia town approx. 19.43 km expansion is proposed in the projected area. **Proposed new – Total pipeline 19.43 km** 180 mm dia = 16216 m 225 mm dia = 1559 m 250 mm dia = 1157 m 280 mm dia = 388 m 315 mm dia = 115 m

Particulate	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
	250 mm dia HDPE PN-10 = 975 (RM) 280 mm dia HDPE PN-10 = 2225 (RM) 300 mm dia DI K9= 765 (RM) 350 mm dia DI K9= 345 m (RM) 400 mm dia DI K9= 166 m (RM) Distribution pipes will be laid along the roads, within the road right of way of existing roads of town		Distribution pipes will be laid along the roads, within the road right of way of existing roads of town	160 mm Dia. HDPE – 264 m 180 mm Dia. HDPE – 365 m 200 mm Dia. HDPE – 1085 m 225 mm Dia. HDPE- 1922 m 250 mm Dia. HDPE – 1768 m 280 mm Dia. HDPE – 172 m 250 mm Dia. DI K7 – 210 m Distribution pipes will be laid along the roads, within the road right of way of existing roads of town	
House Service connection	11485	3591	3180	1528	3969
Magnetic Bulk Flow Meters and consumer meters - Measurement of water flow	7- Bulk water flow meter 11485 - consumer meters	10- Bulk water flow meter. 3591 -- consumer meters	12- Bulk water flow meter. 2998 - consumer meters nos.	4- Bulk water flow meter 4621 - consumer meters	5 numbers of Bulk water flow meter 6692 numbers of consumer water meters

E. Operation and Maintenance

30. The Operator will maintain the water supply project for a period of 5 years on behalf of local body collecting the tariff from the consumers as per the tariff fixed by the Government of Tripura and with the support of balance funding for O&M from GoT. This 5 years period will be utilized to establish an efficient O&M system and to give training to the staff of the Municipal Councils (MCs) on the project activities by enhancing their capacity on technical as well as on the administrative fields. This will enable the MCs to take over the responsibility of O&M from the Operator realizing their ownership of assets created and to render service to the public by themselves as per the powers conferred on them under 74th Constitutional Amendment.

F. Subproject Benefits

31. The subproject is primarily designed to improve environmental quality and living conditions of project towns through provision of water supply. The subproject is primarily designed to improve environmental quality and living conditions of these towns through provision of water supply. The benefits arising from this subproject include: (i) increased availability of potable water at appropriate pressure to all households including urban poor; and (ii) reduced time and costs in accessing alternative sources of water.

G. Implementation Schedule

32. Implementation of Package of cluster IIA as DBO contract. Project will be implemented in 36 months (6 months for design and 30 months for construction). Bids to be invited for the package. It is assumed that the construction will be commenced from the 3rd quarter of the financial year 2023-2024 and will be completed by the end of 2026. After that 5 years O&M is considered.

33. Figure 2 to 55 shows existing and proposed water supply components in google map, proposed Intake, WTP, Raw & Clear water Transmission main and OHSRs, and area with 100m surroundings of project towns.

Existing and Proposed water supply components Map of Udaipur Town

Figure 2: Existing water supply components in Udaipur google Earth

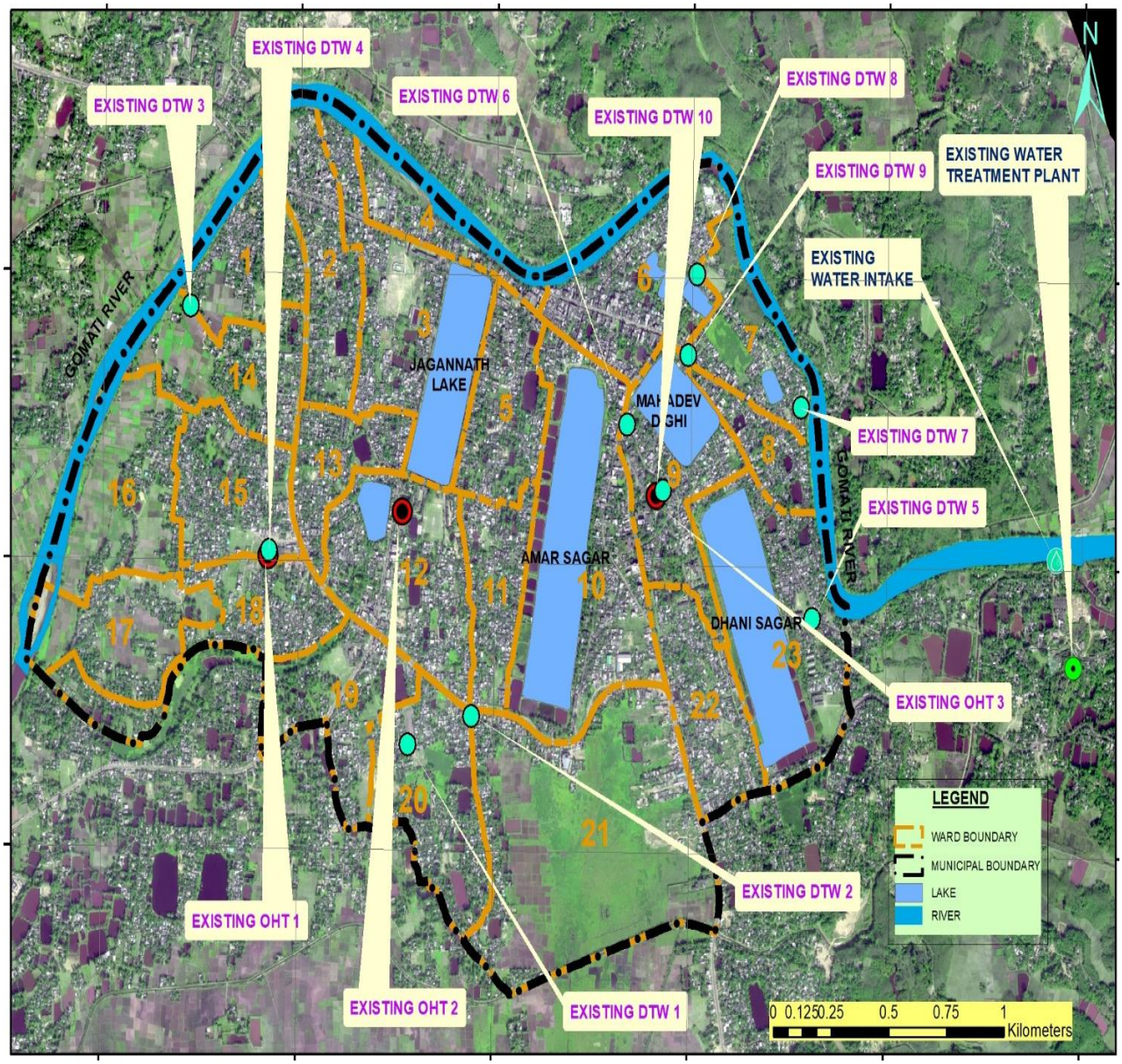


Figure 3: Proposed water supply components in Udaipur google earth

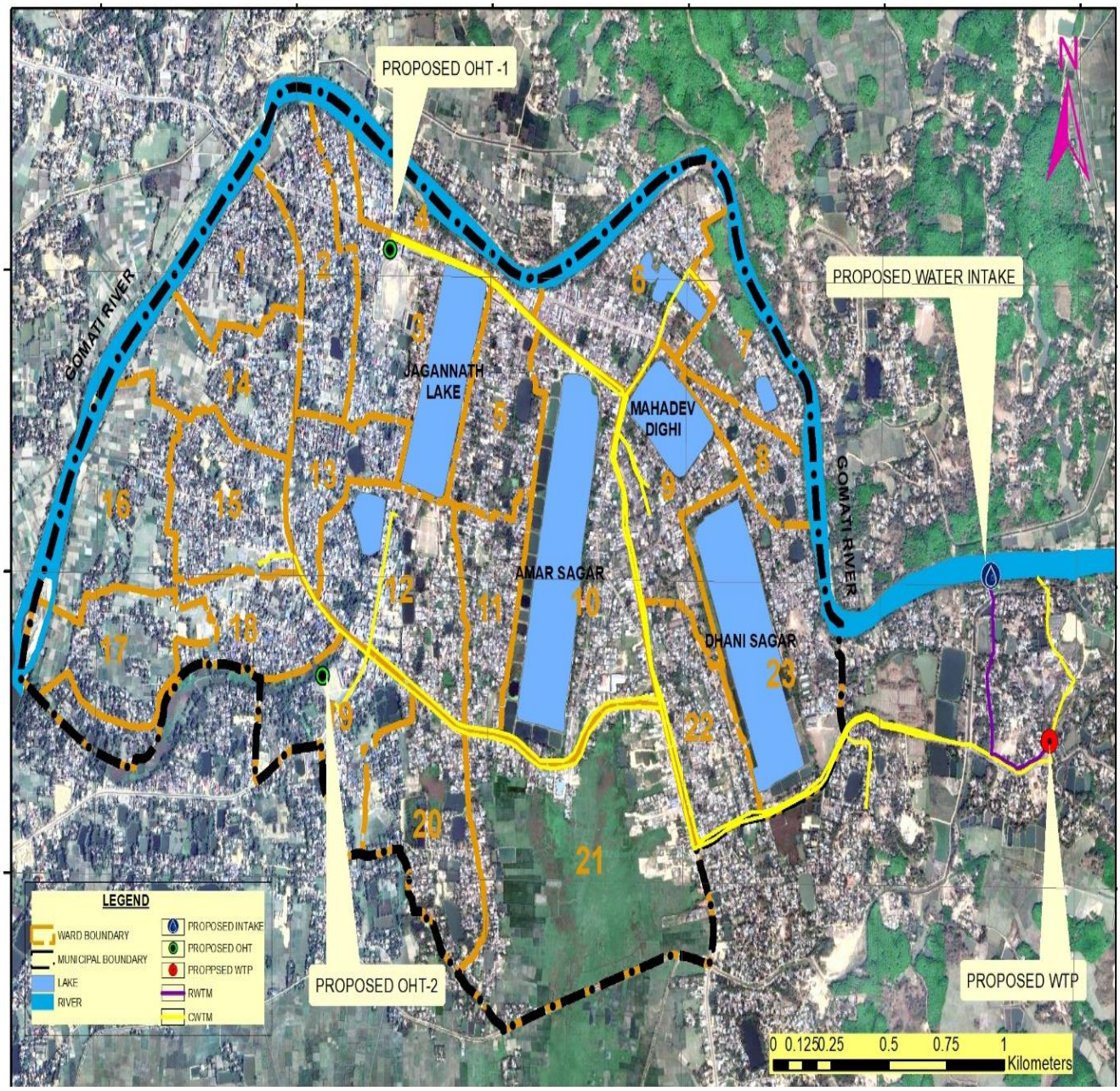


Figure 4: Existing Intake and WTP of Udaipur on Google Earth and Surrounding

Figure 5: Existing WTP and Proposed WTP Site.

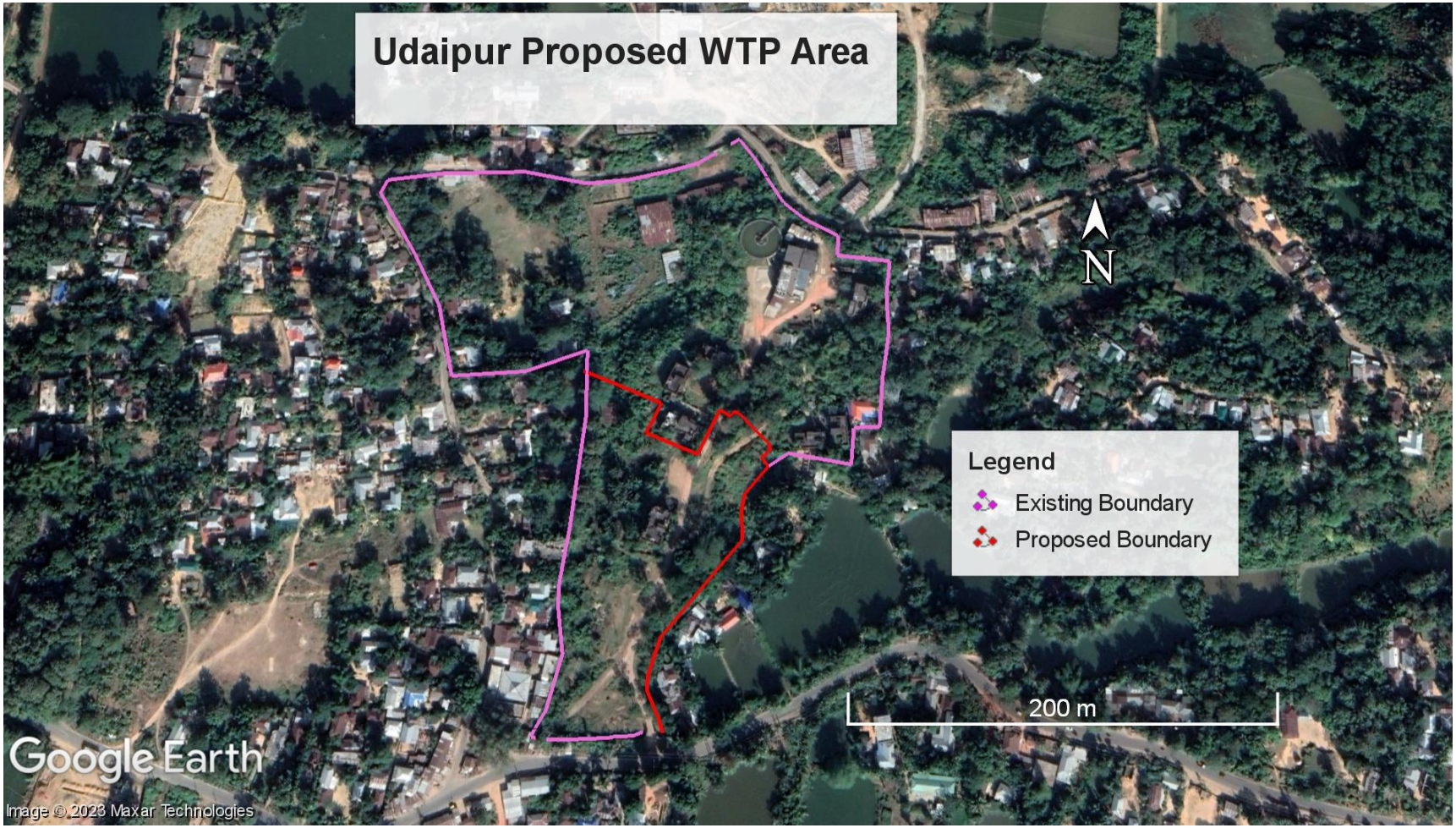


Figure 6: Proposed Clear Water & Raw Water Transmission Main Network with Intake, WTP and OHSRs-Udaipur

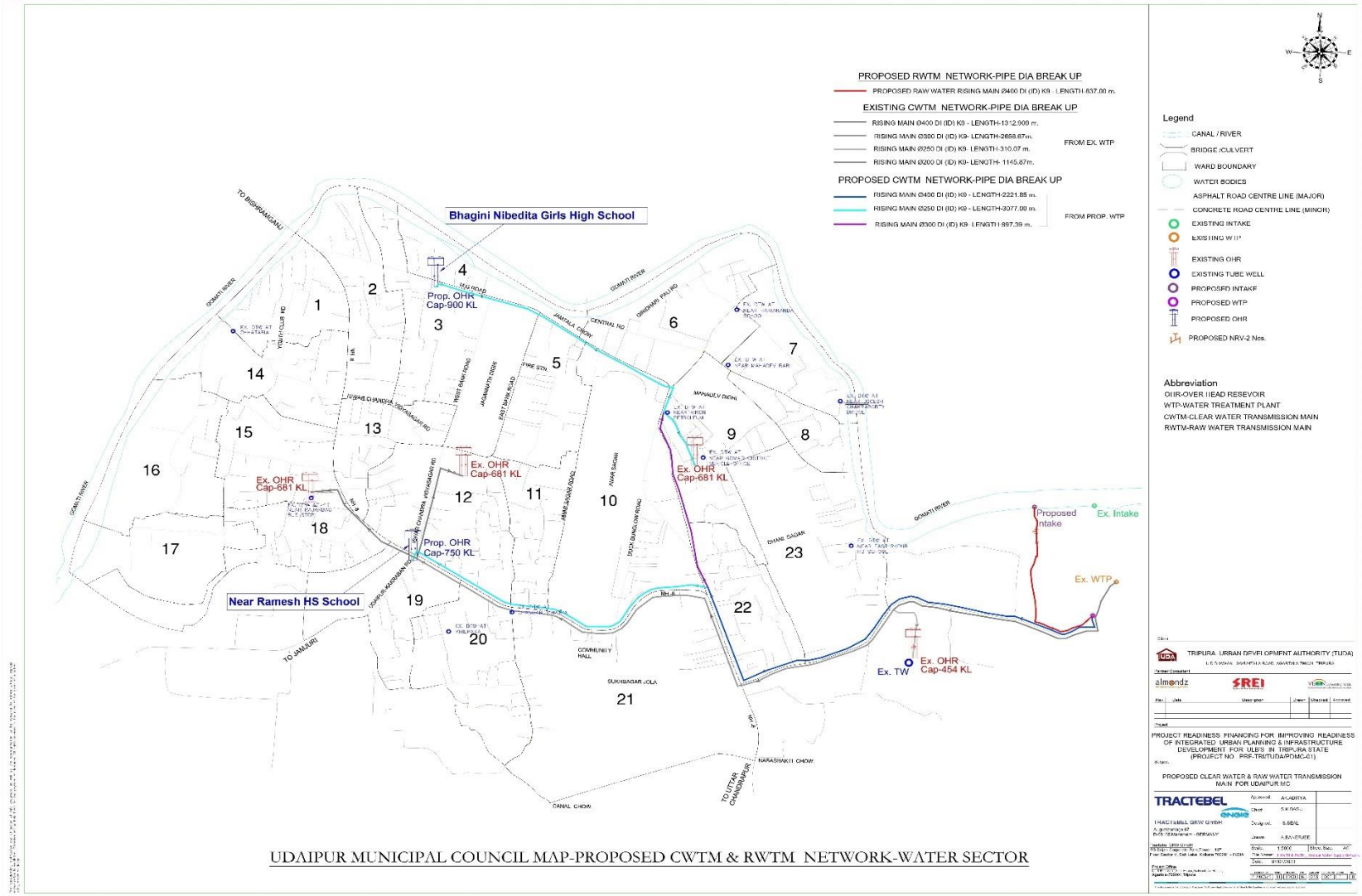


Figure 7: Proposed Intake, WTP, Raw water transmission mains(blue) passing through earthen road, and 100 surrounding to intake WTP

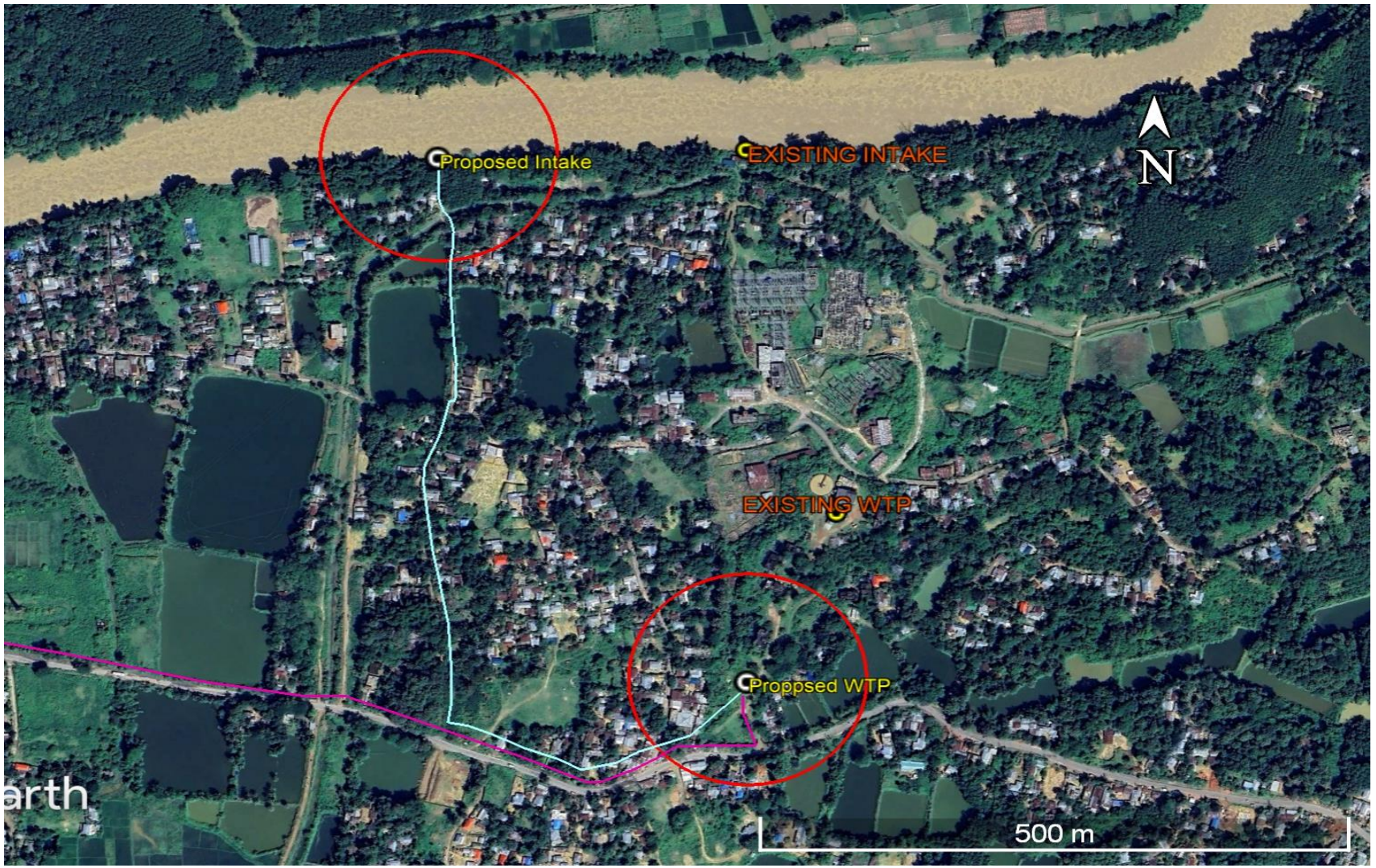


Figure 8: Proposed OHR at Bhagani Nibedita Girls High School and 100m surroundings

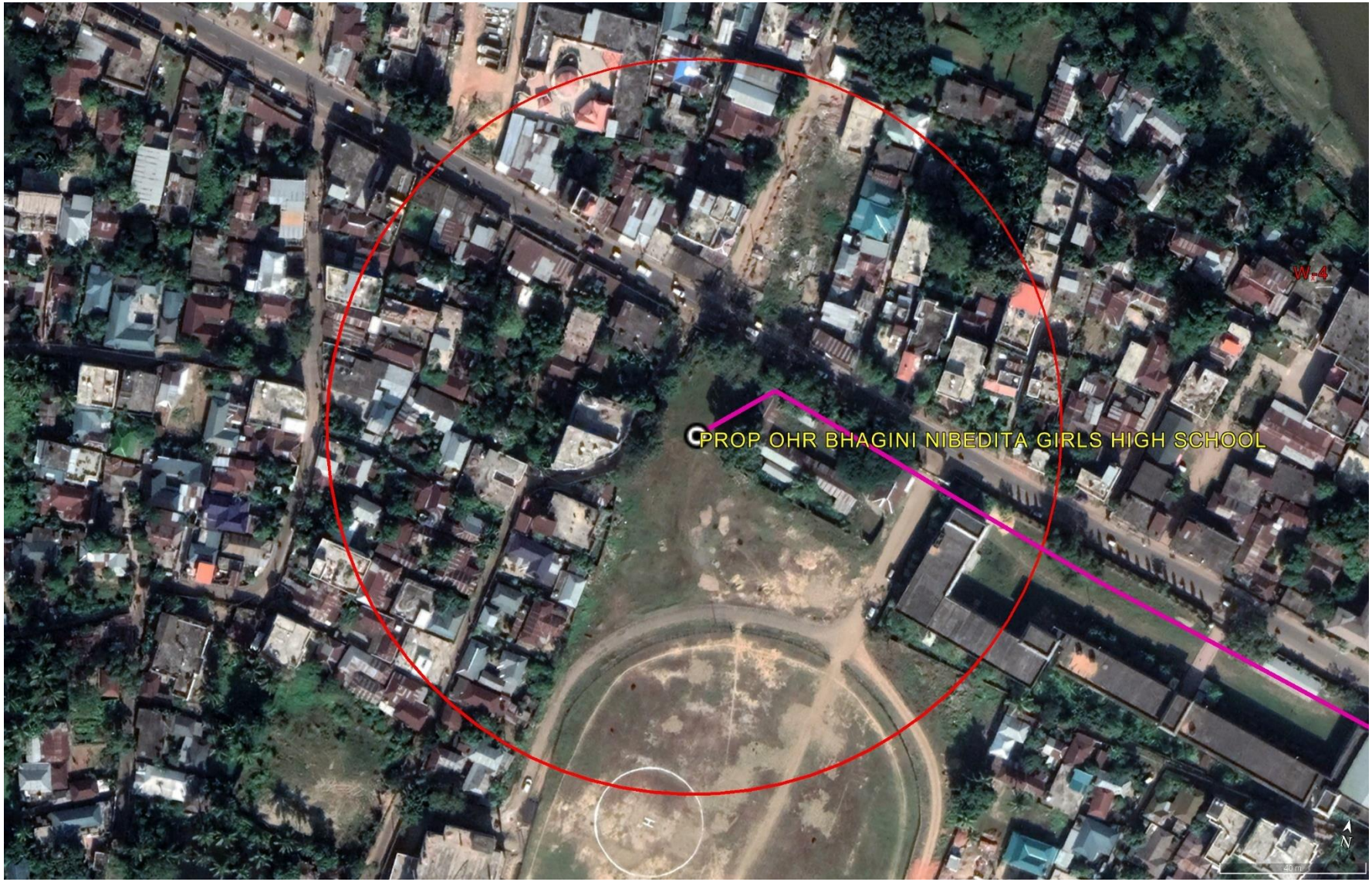


Figure 9: Proposed OHR at Ramesh High School and 100m surroundings

Figure 10: Proposed distribution networks - Udaipur

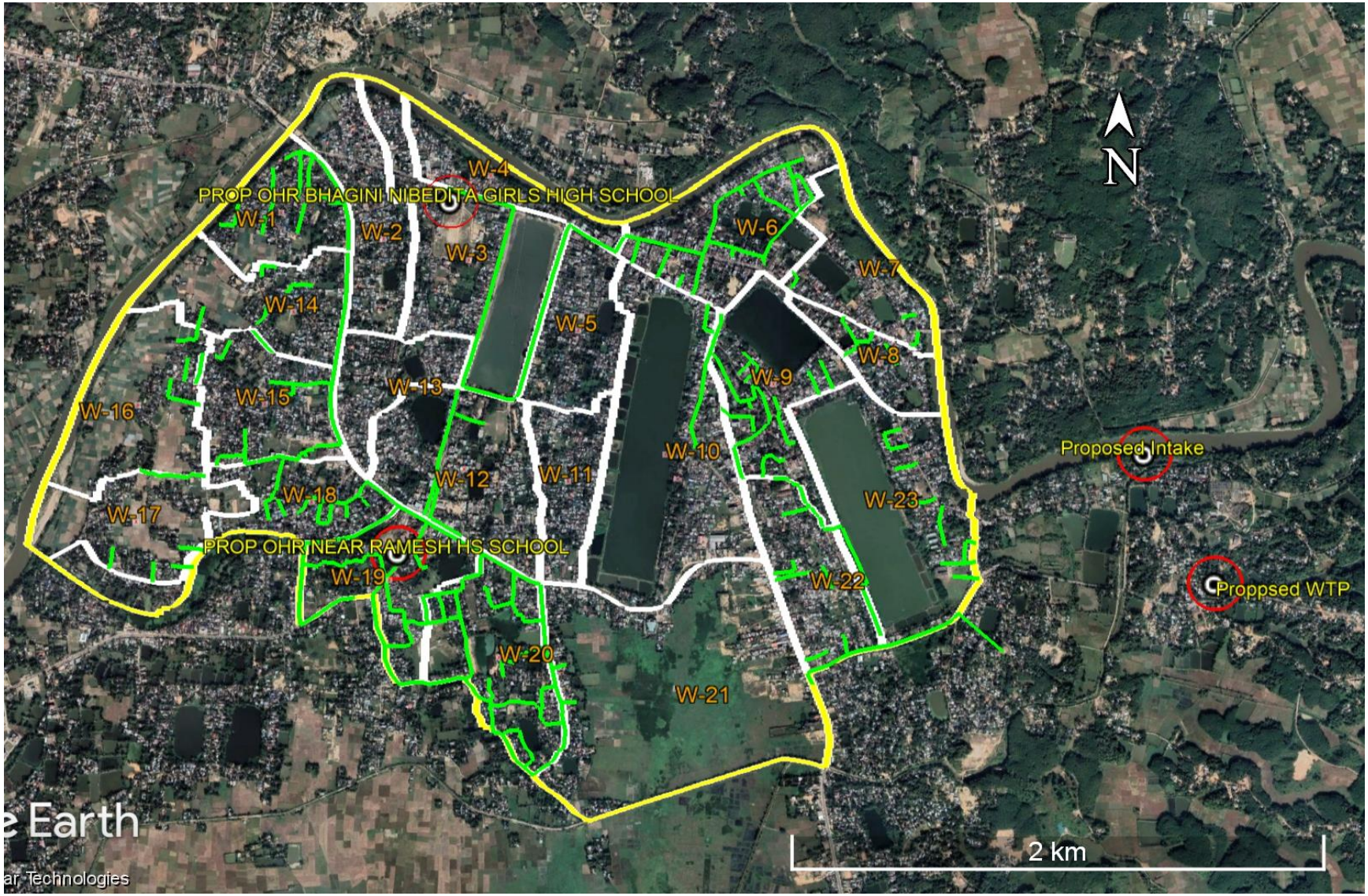


Figure 11: Proposed DMA Map of Udaipur MC

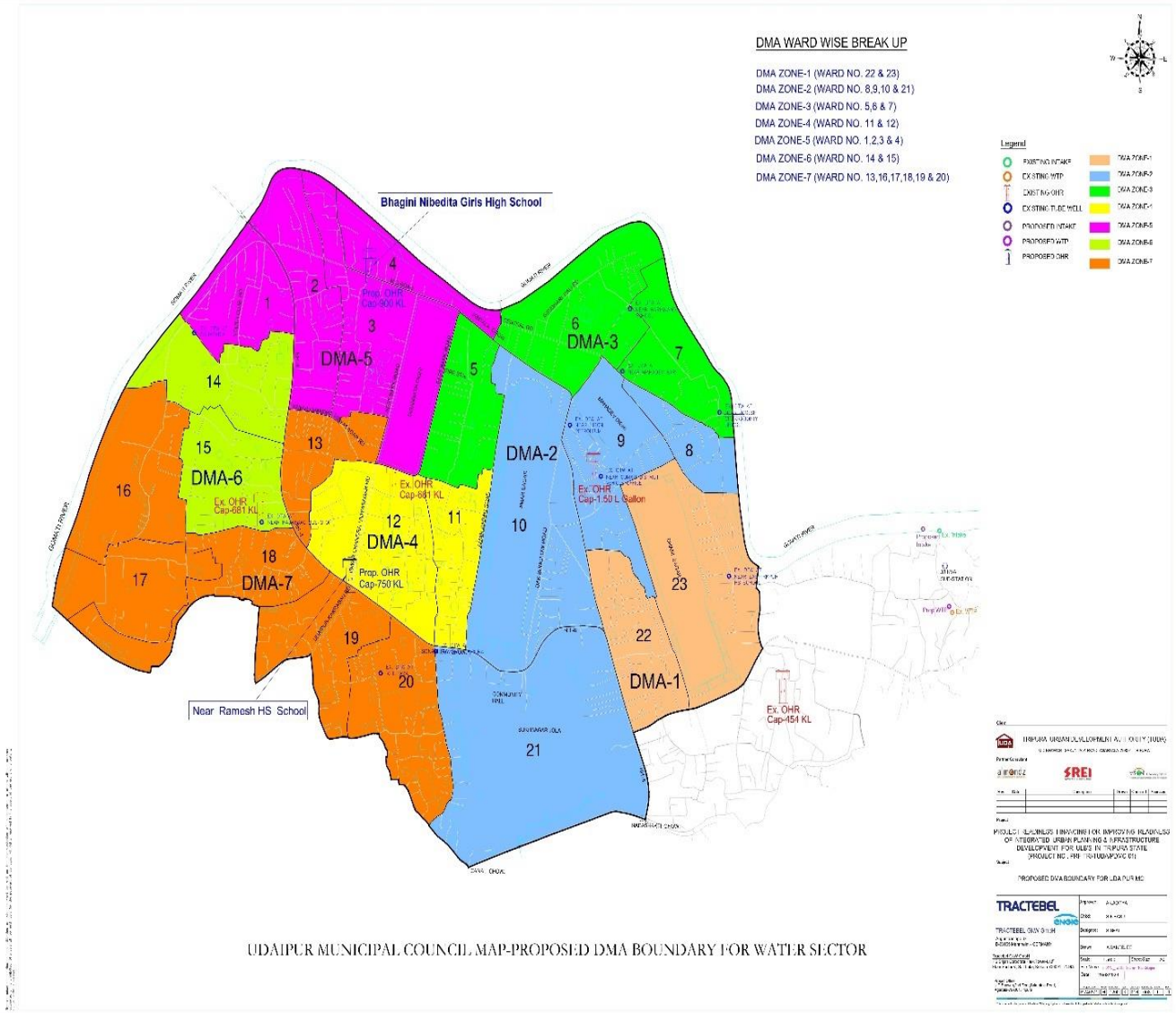


Figure 12: Proposed Intake Layout Plan for Udaipur

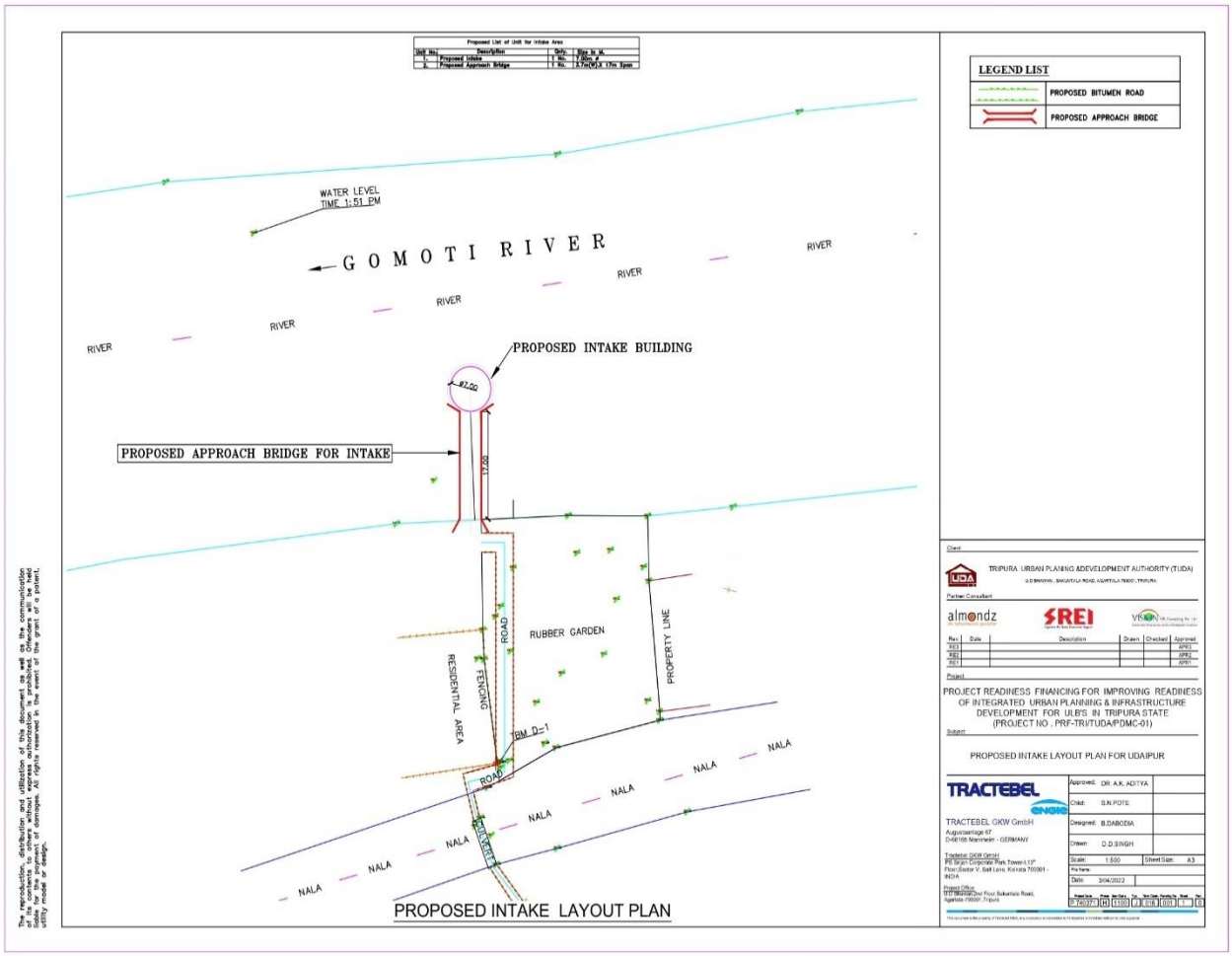


Figure 13: Layout Map of Water Treatment Plant at Udaipur (Showing Backwash and Sludge handling tanks)

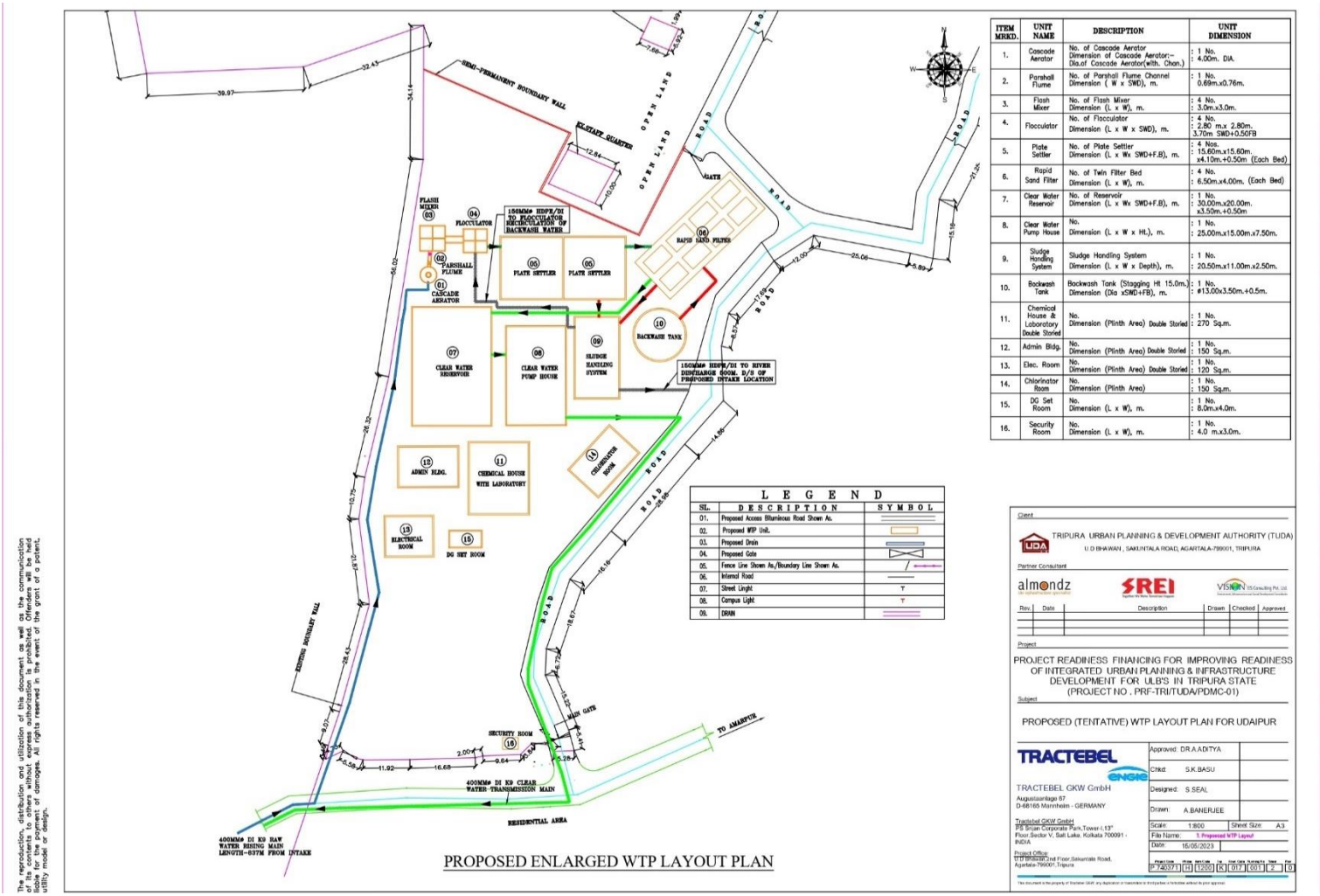


Figure 14: Hydraulic flow diagram of proposed water Treatment plant at Udaipur MC

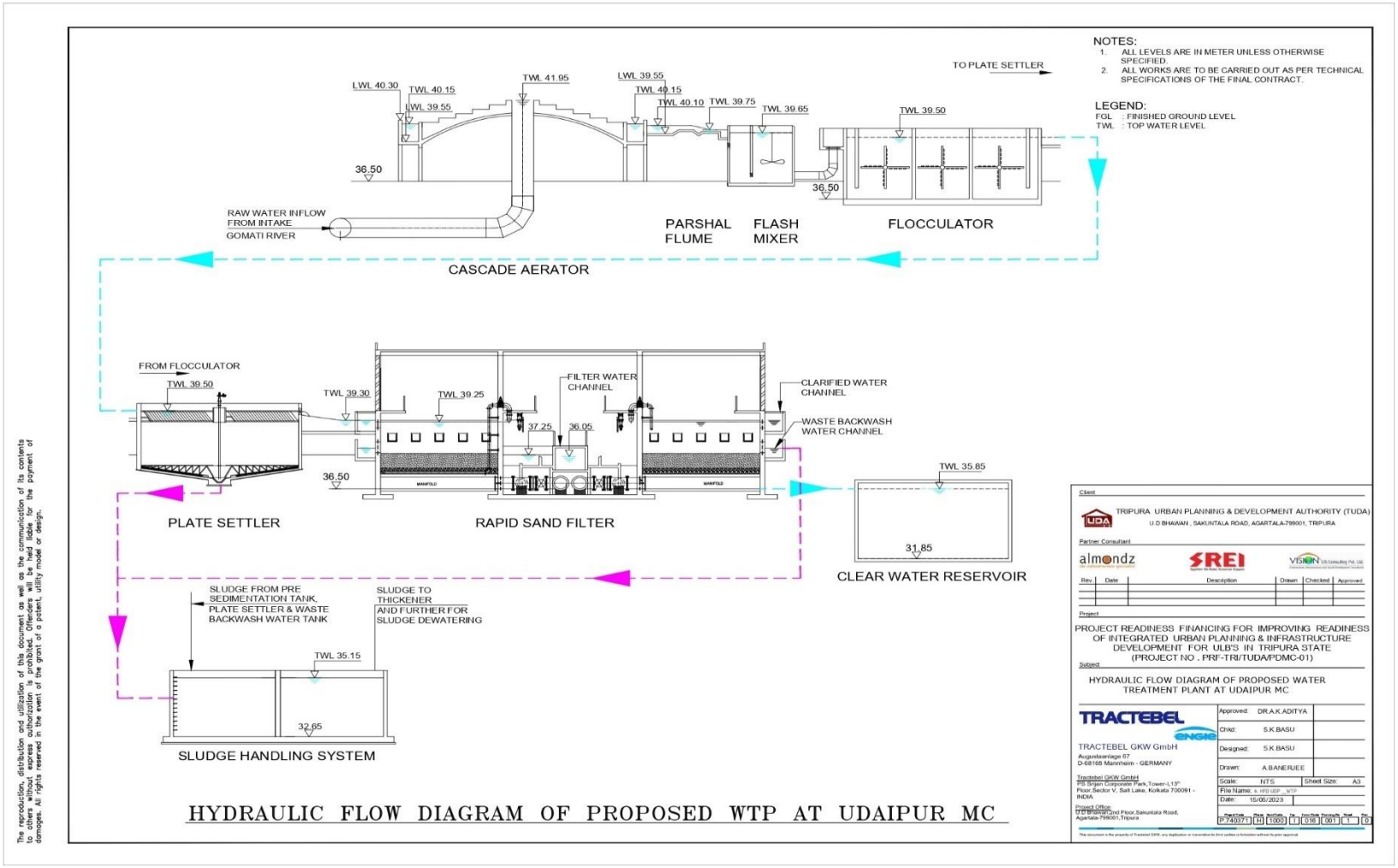


Figure 15: Proposed OHSR Layout plan– Bhagini Nibedita Girls School at Udaipur

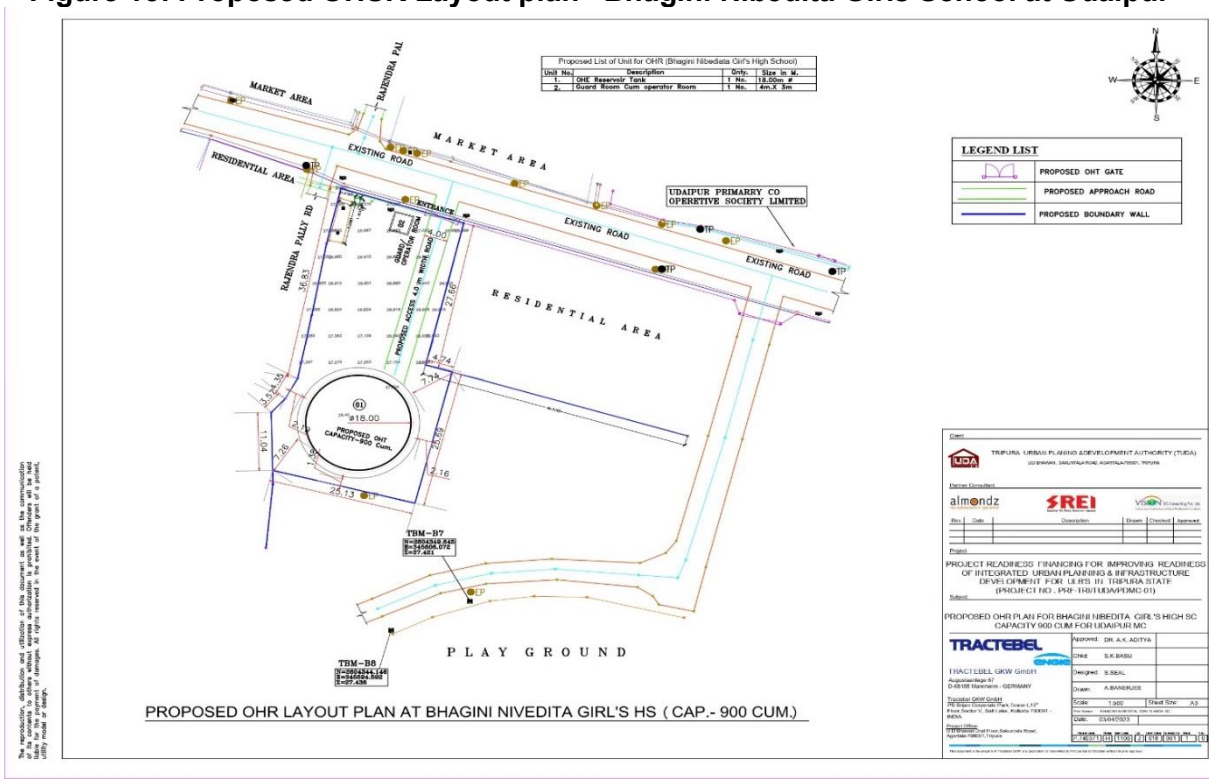
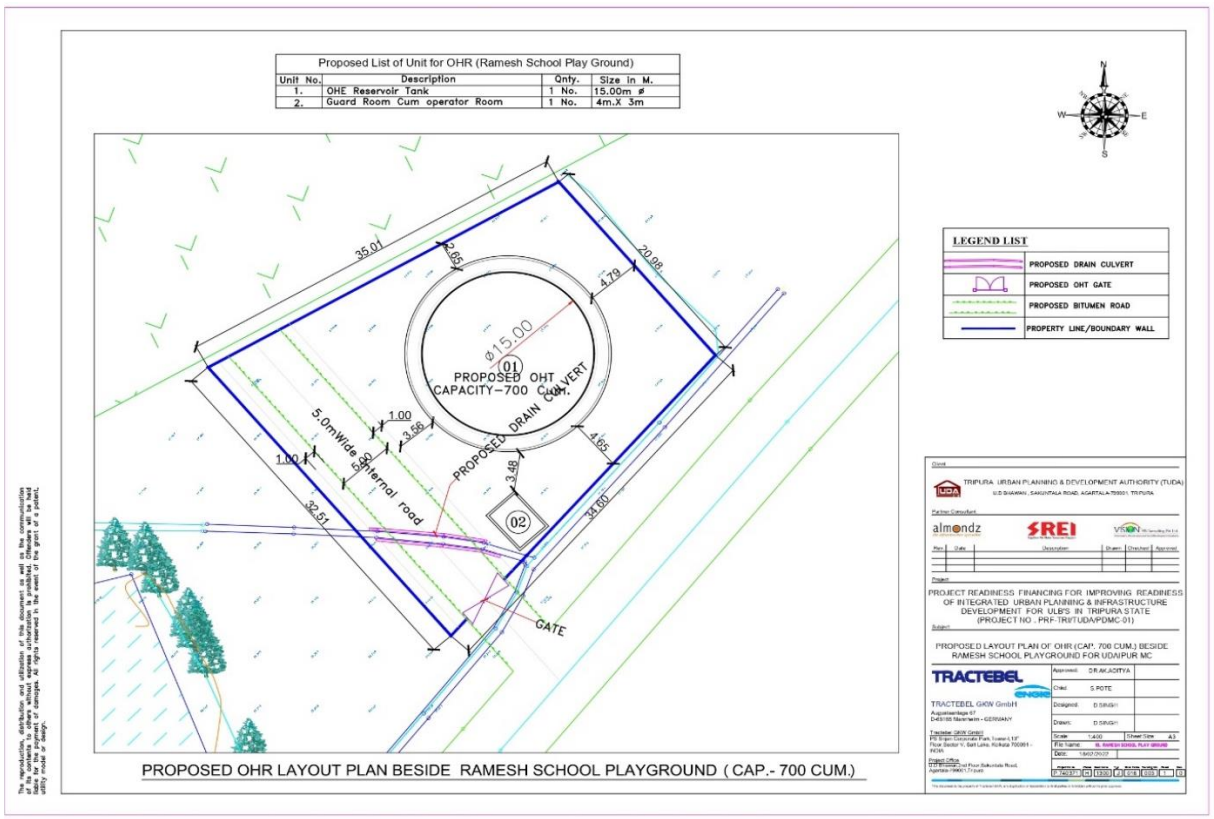


Figure 16: Proposed OHSR - Ramesh School Playground at Udaipur



Existing and Proposed water supply components Map of Amarpur Town

Figure 17: Existing water supply components in Amarpur on google earth

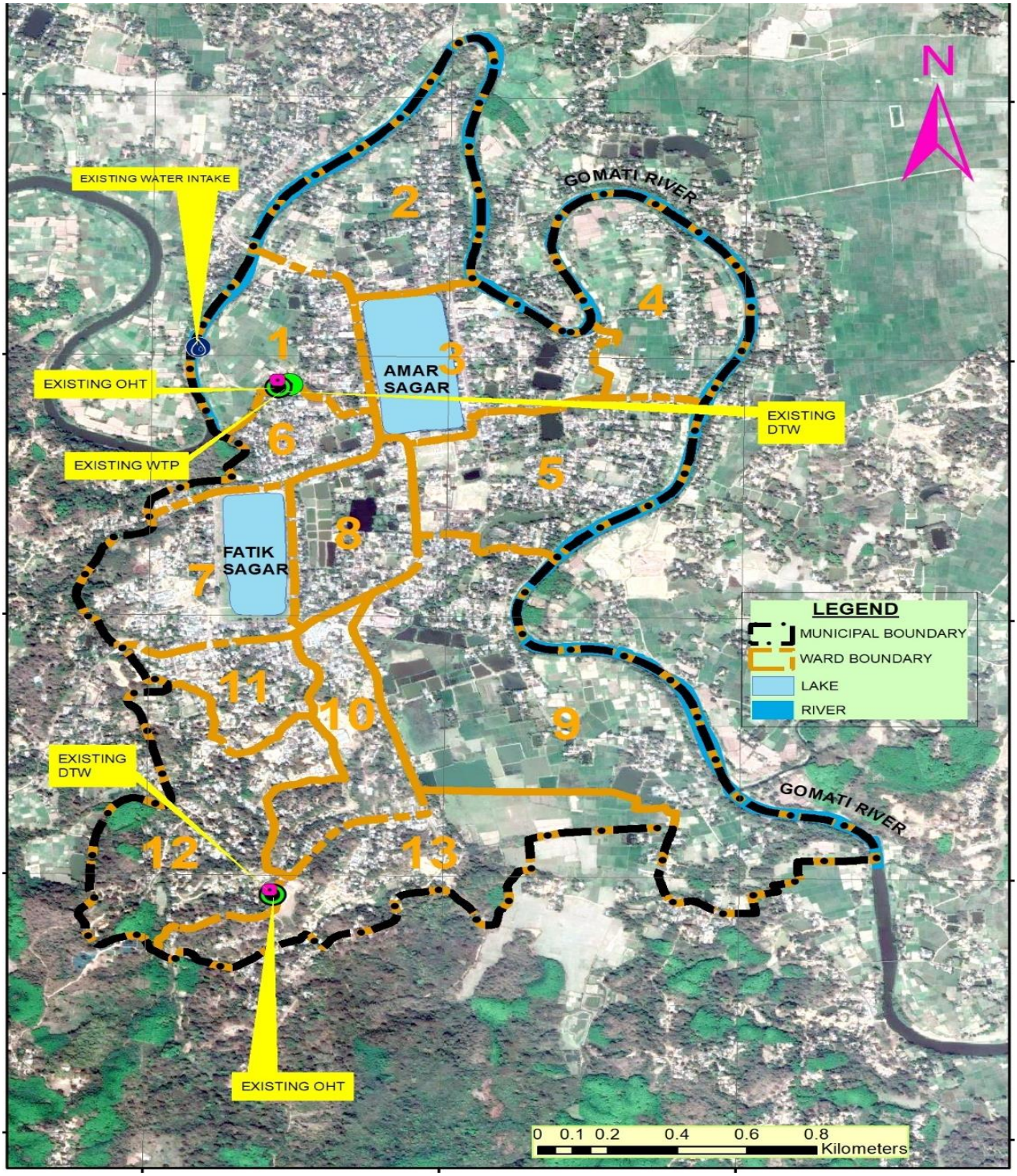


Figure 18: Existing intake WTP with 100m surroundings

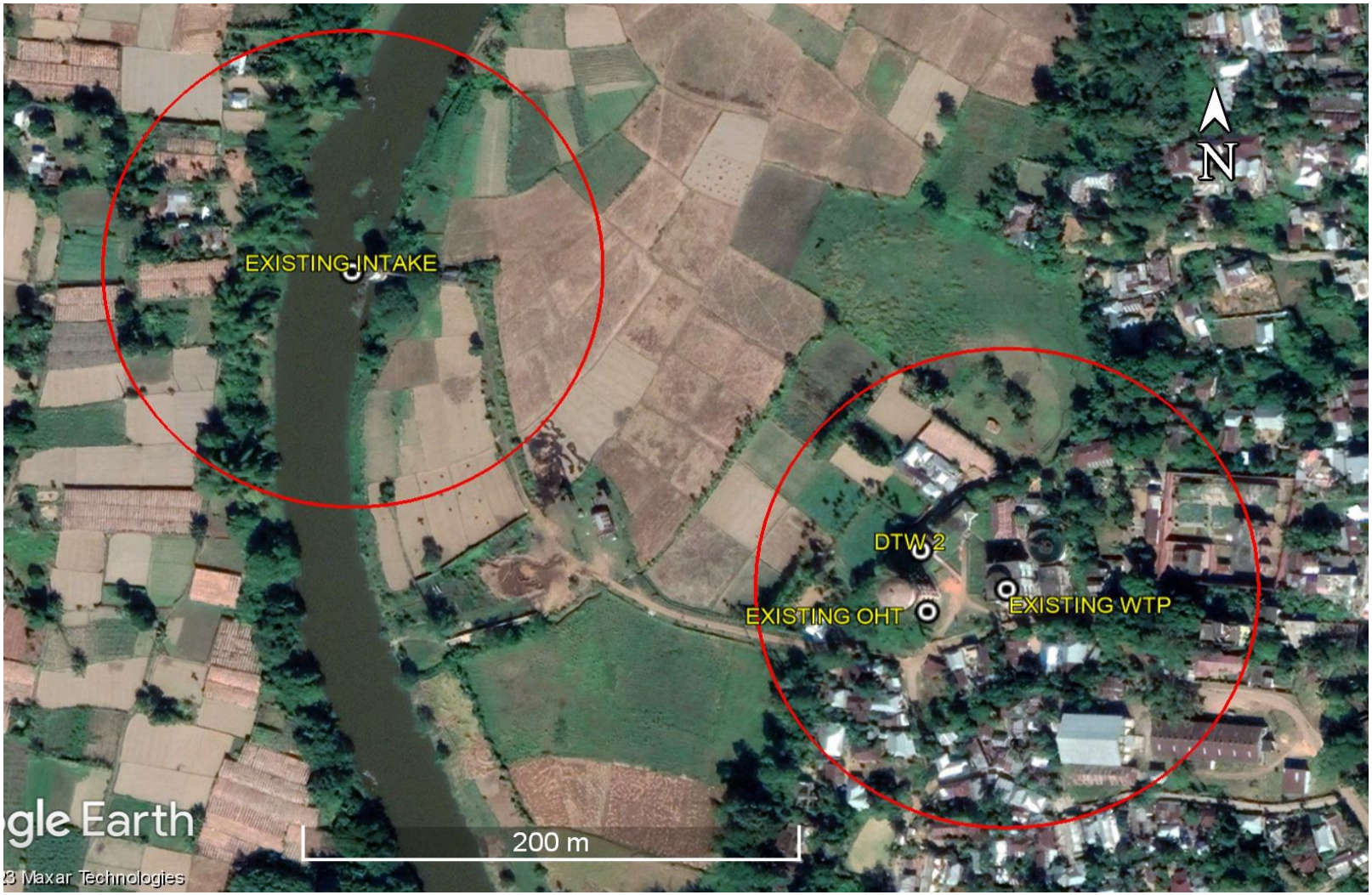


Figure 19: Proposed DMA area of Amarpur

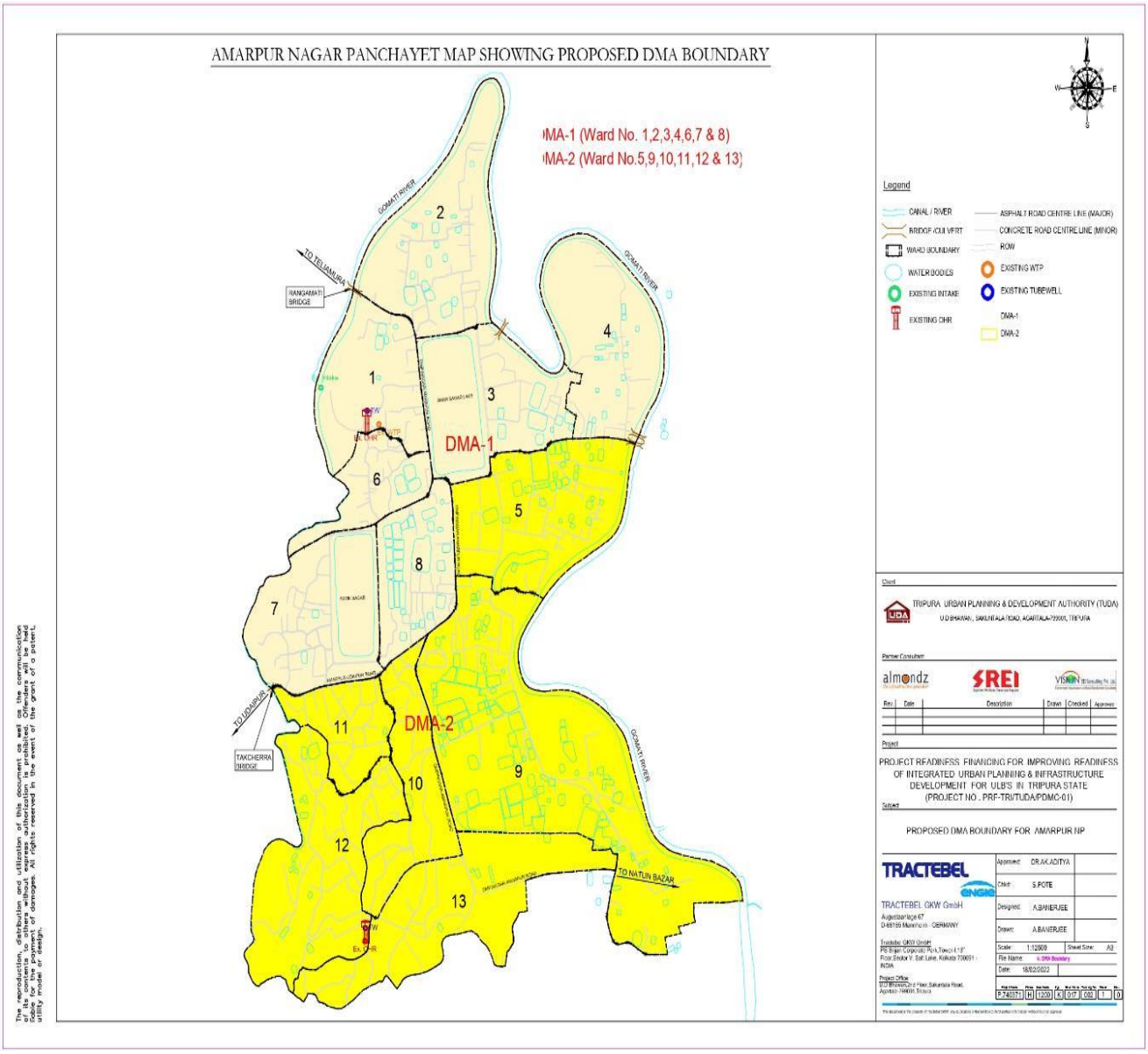
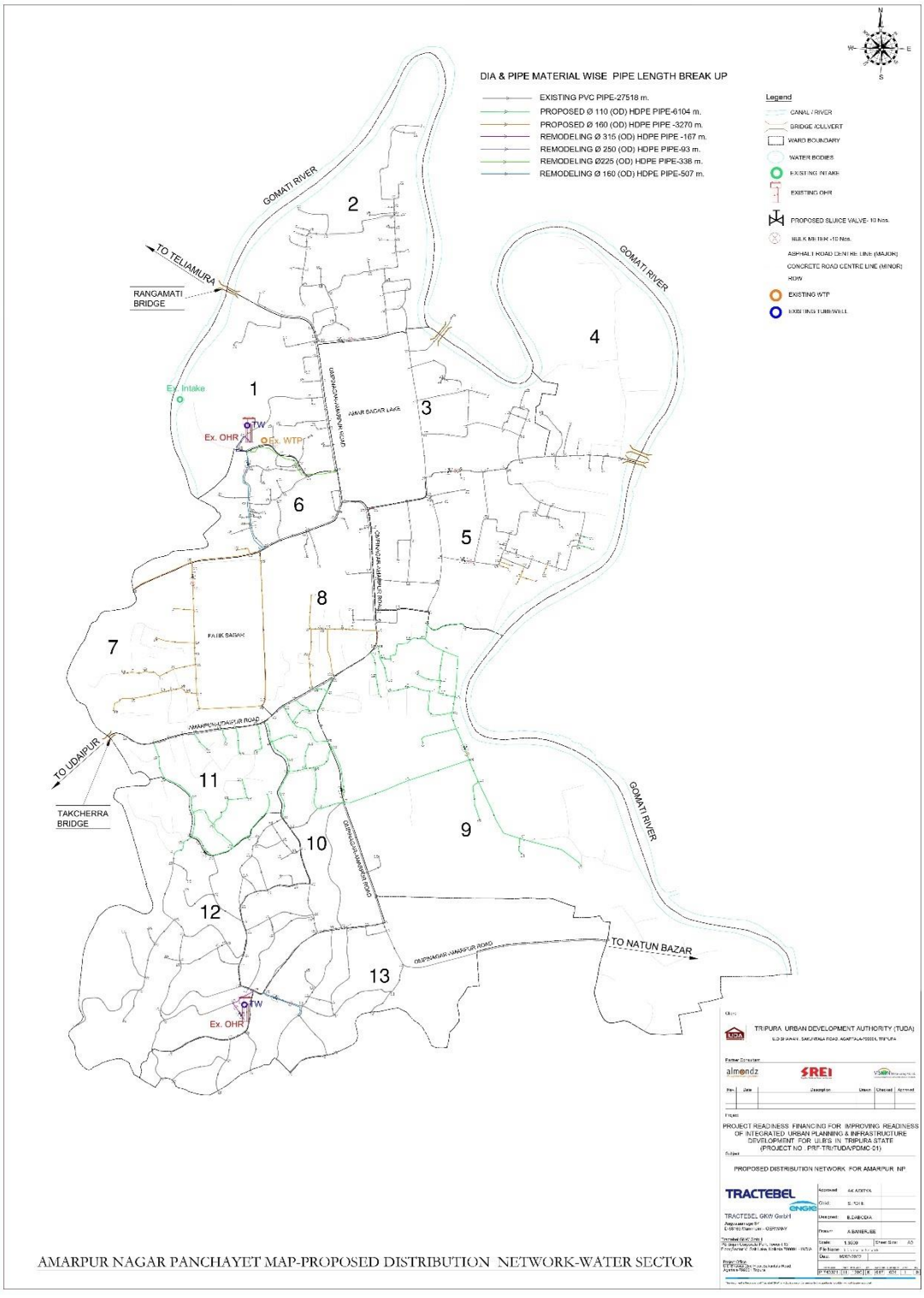


Figure 20: Proposed water supply distribution main for Amarpur



Existing and Proposed water supply components Map of Bishramganj town

Figure 21*:* Existing water supply components in Bishramganj on google earth

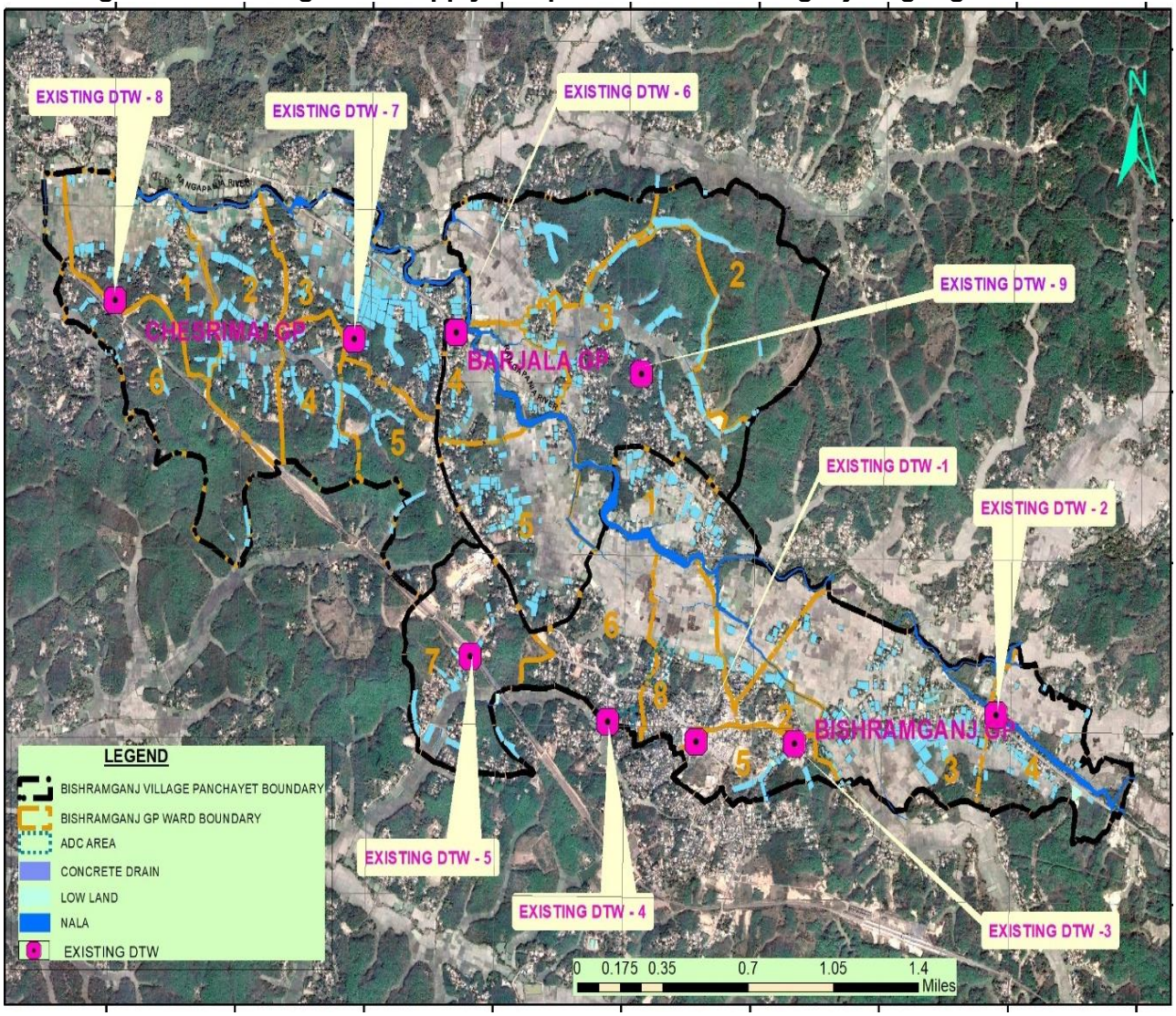


Figure 22: Proposed water supply components in Bishramganj on google earth

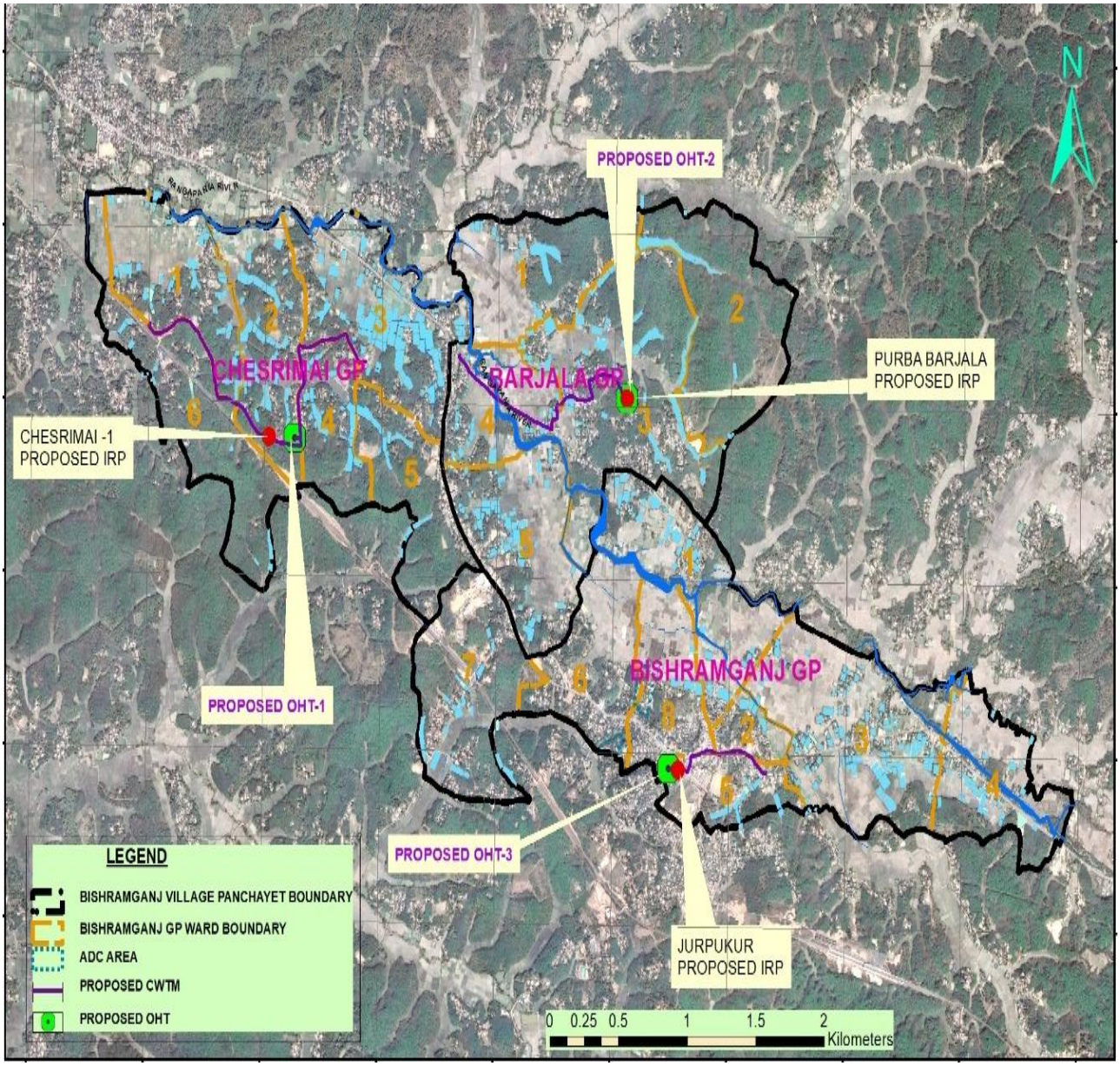


Figure 23: Proposed Clear water Transmission main and OHSRs at Bishramganj

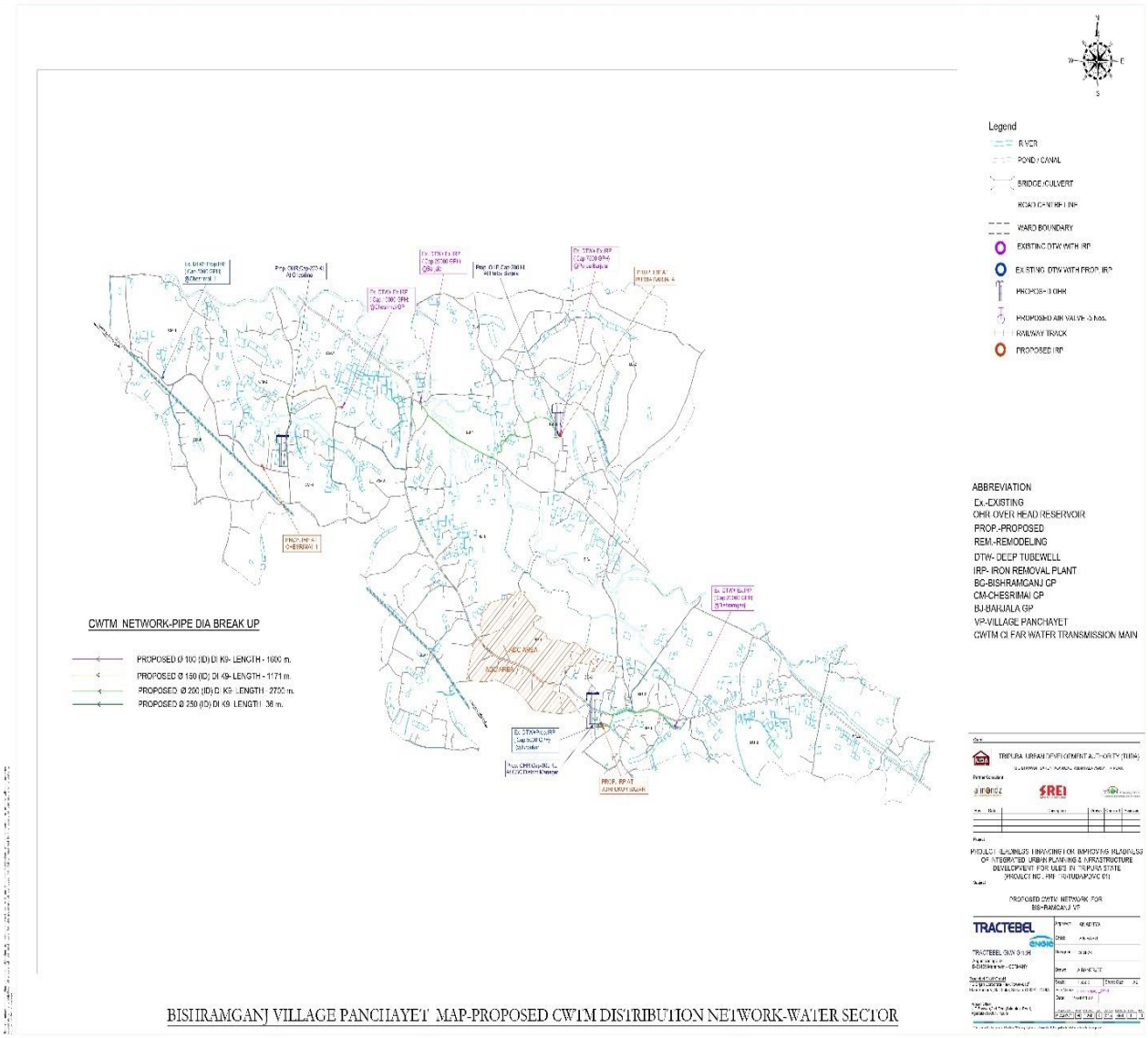


Figure 24: Proposed OHT-1 Location (near Rubber plantation) with 100 m surroundings- Chesrimai

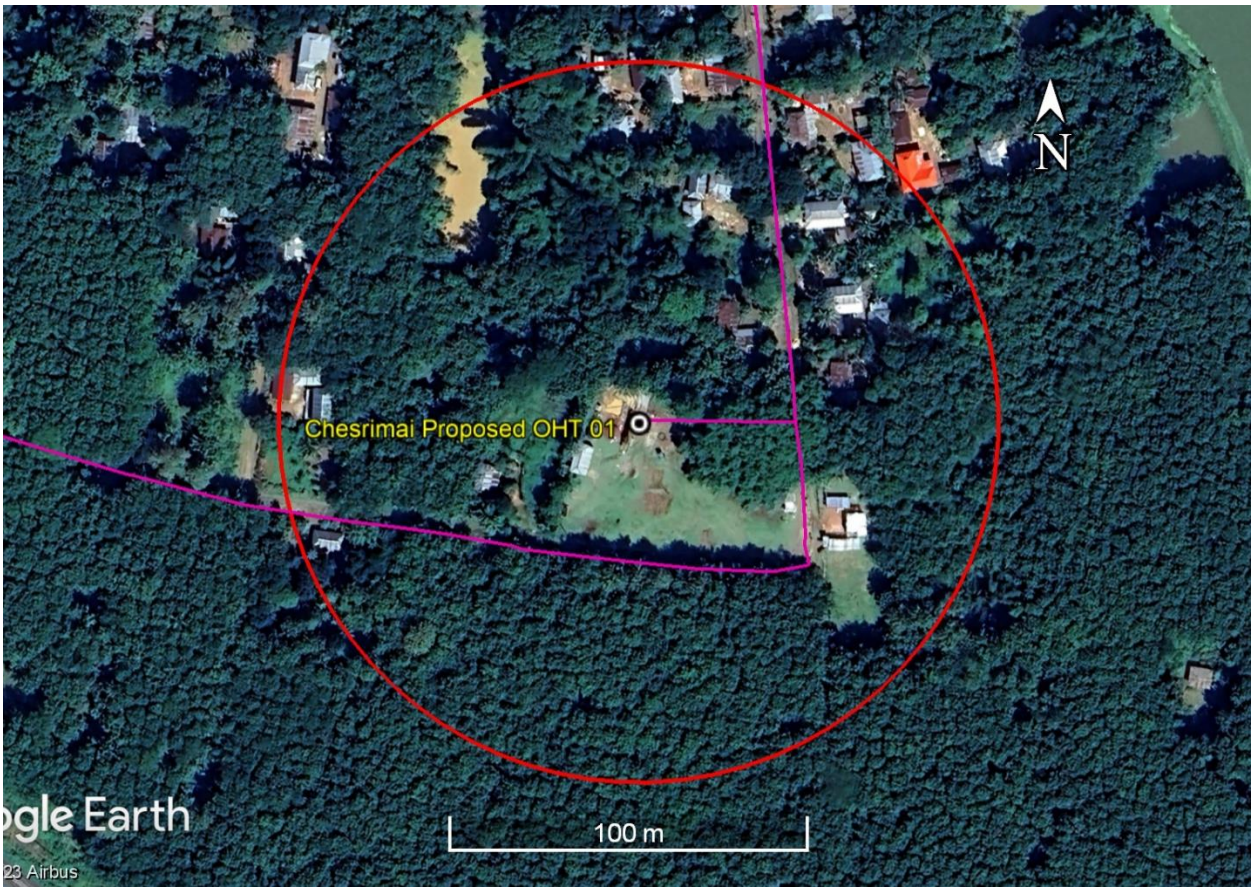


Figure 25: Proposed OHT-2 Location (near Rubber plantation) with 100m surroundings- Purba Barjala

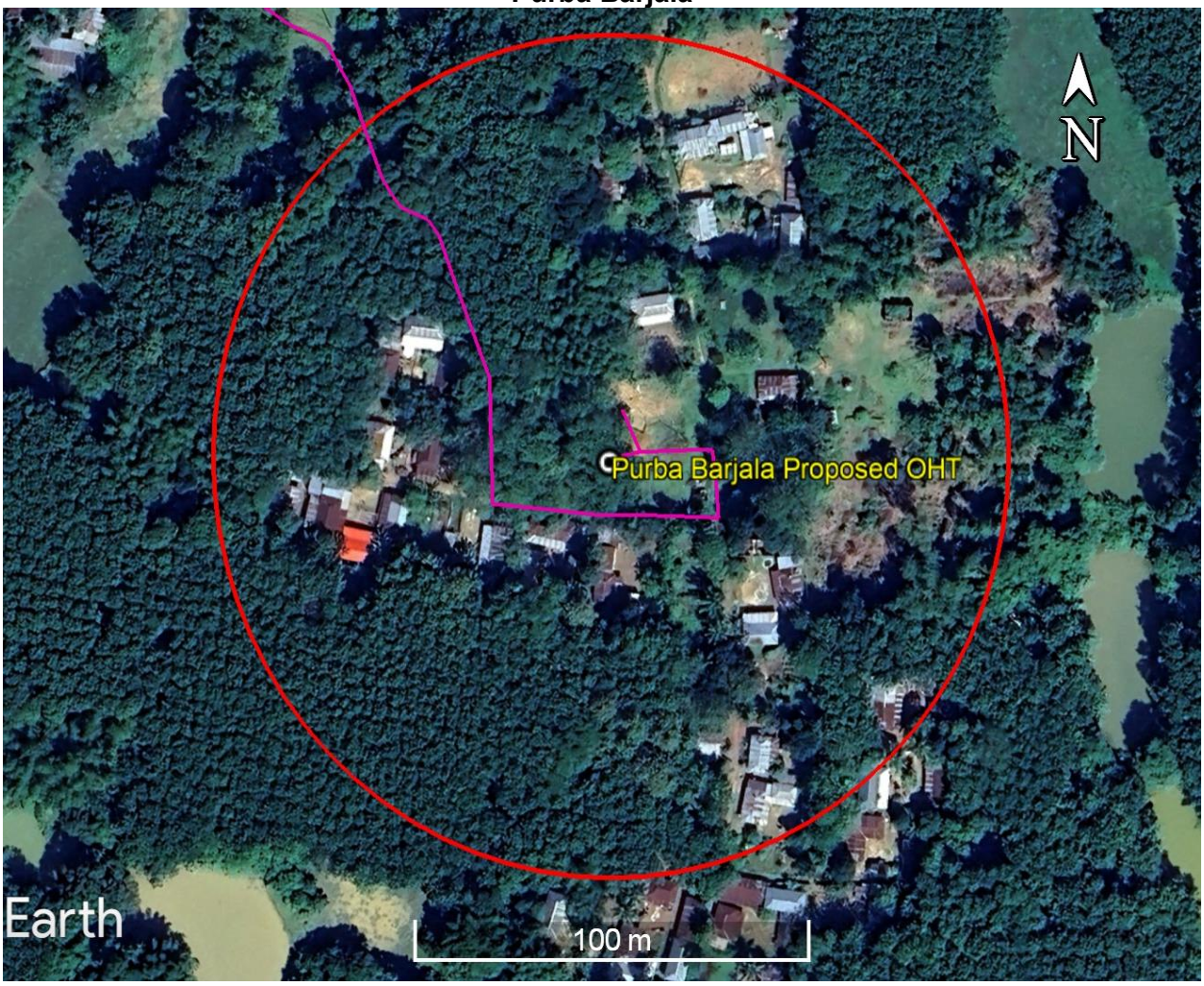


Figure 26: Proposed OHT-3 location with 100m surroundings- at CSC District Manager Bishramganj

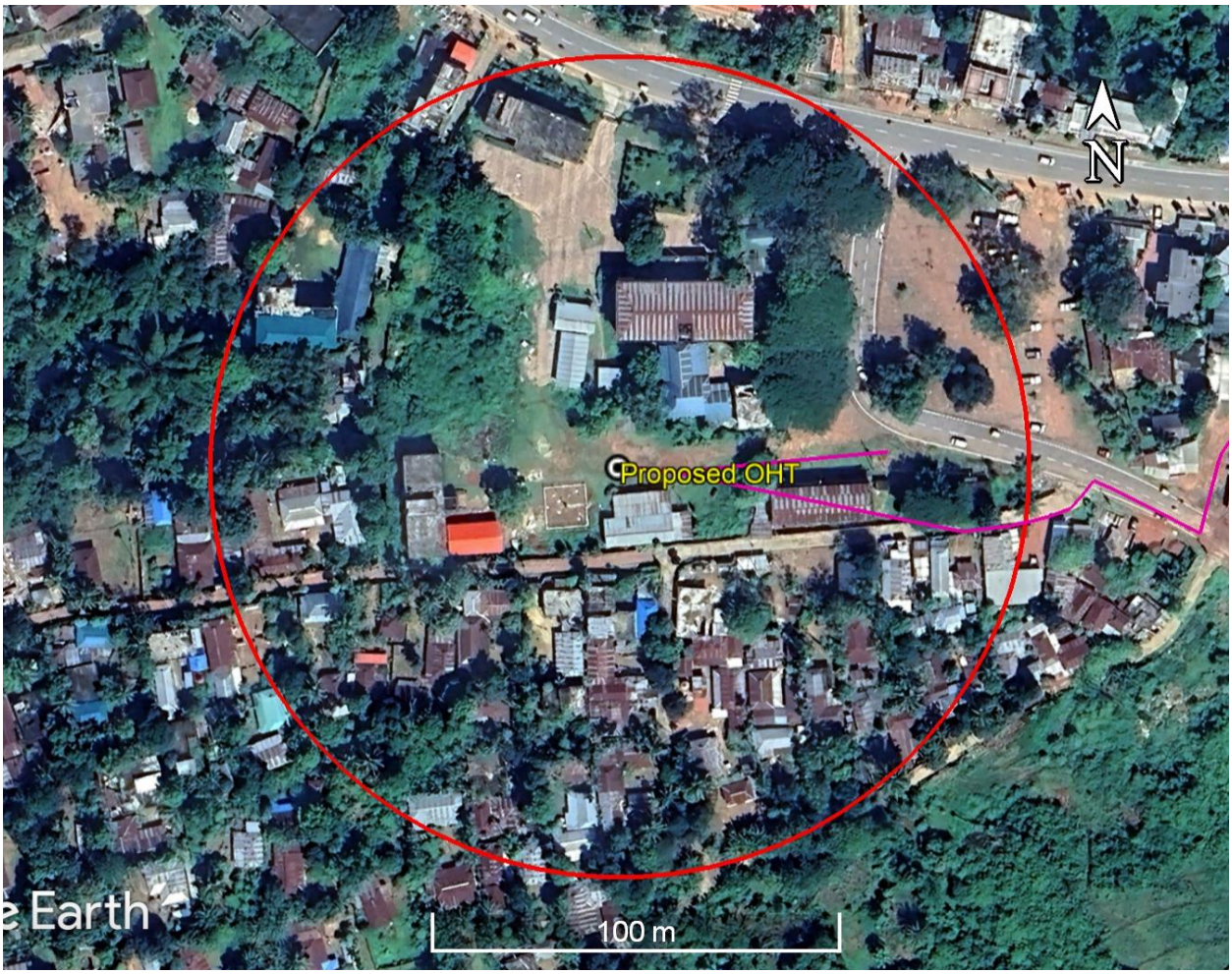


Figure 27: Proposed DMA Boundary Map of Bishramganj

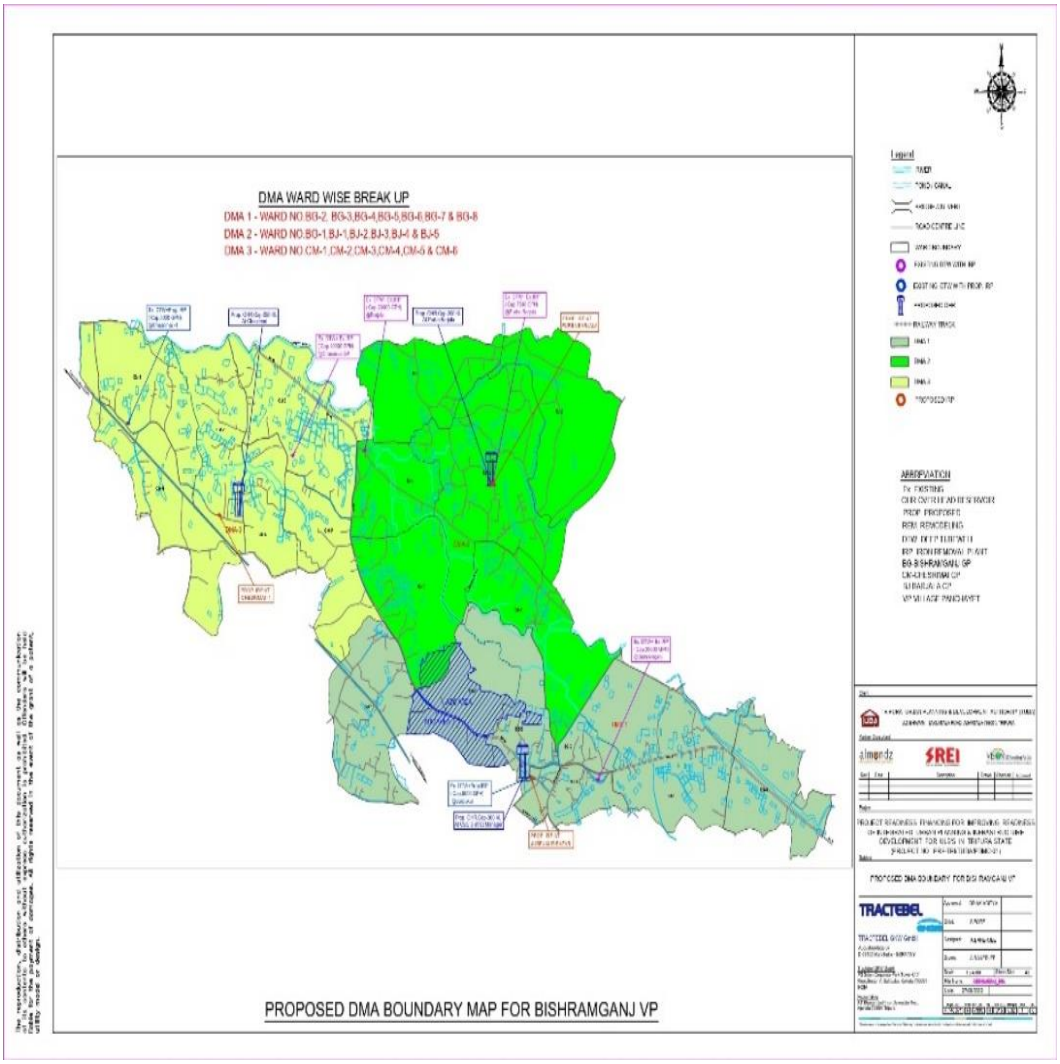


Figure 28*:* Proposed water supply distribution main for Bishramganj

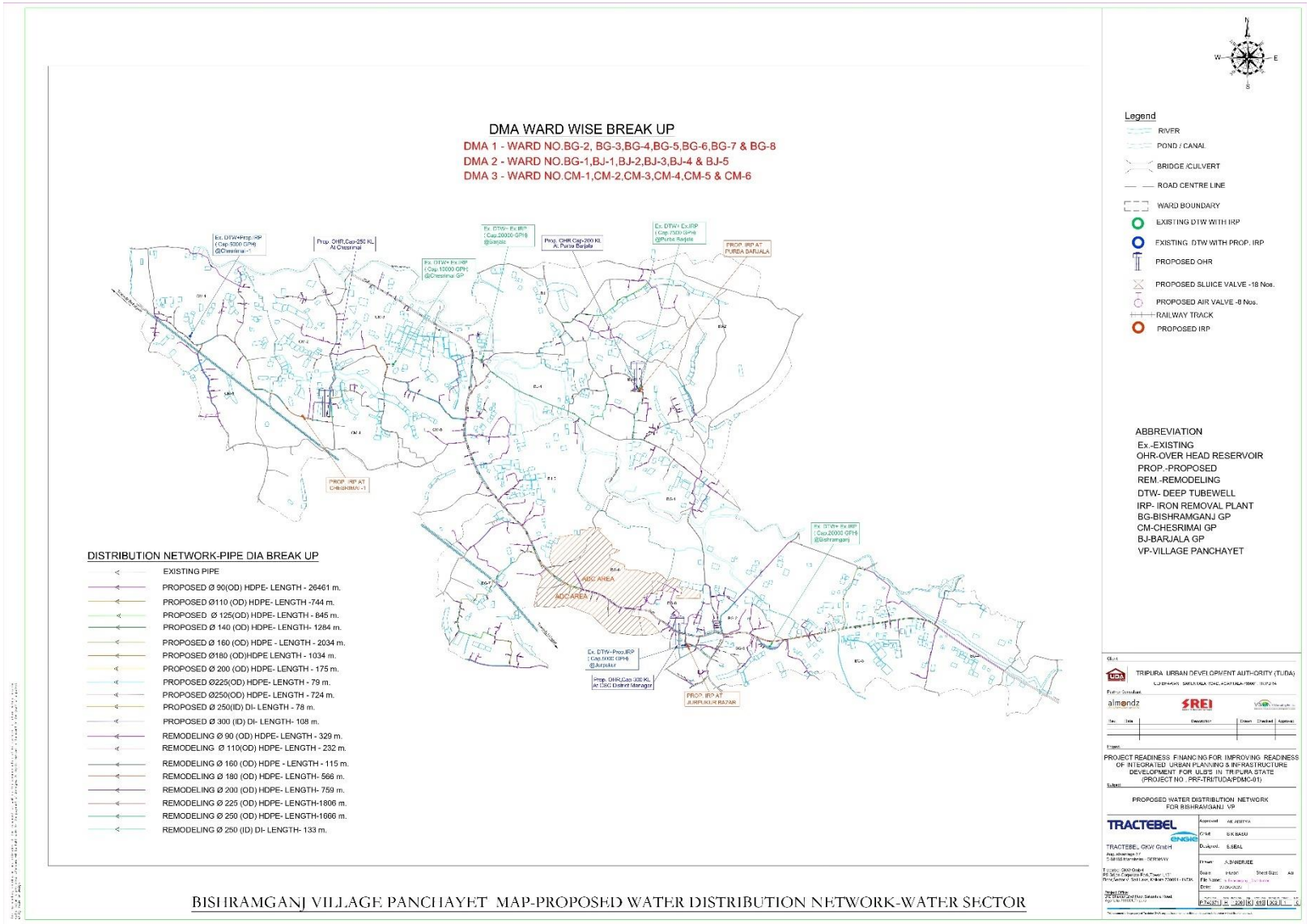


Figure 29: Layout Diagram of Proposed OHSR at Chesrimai

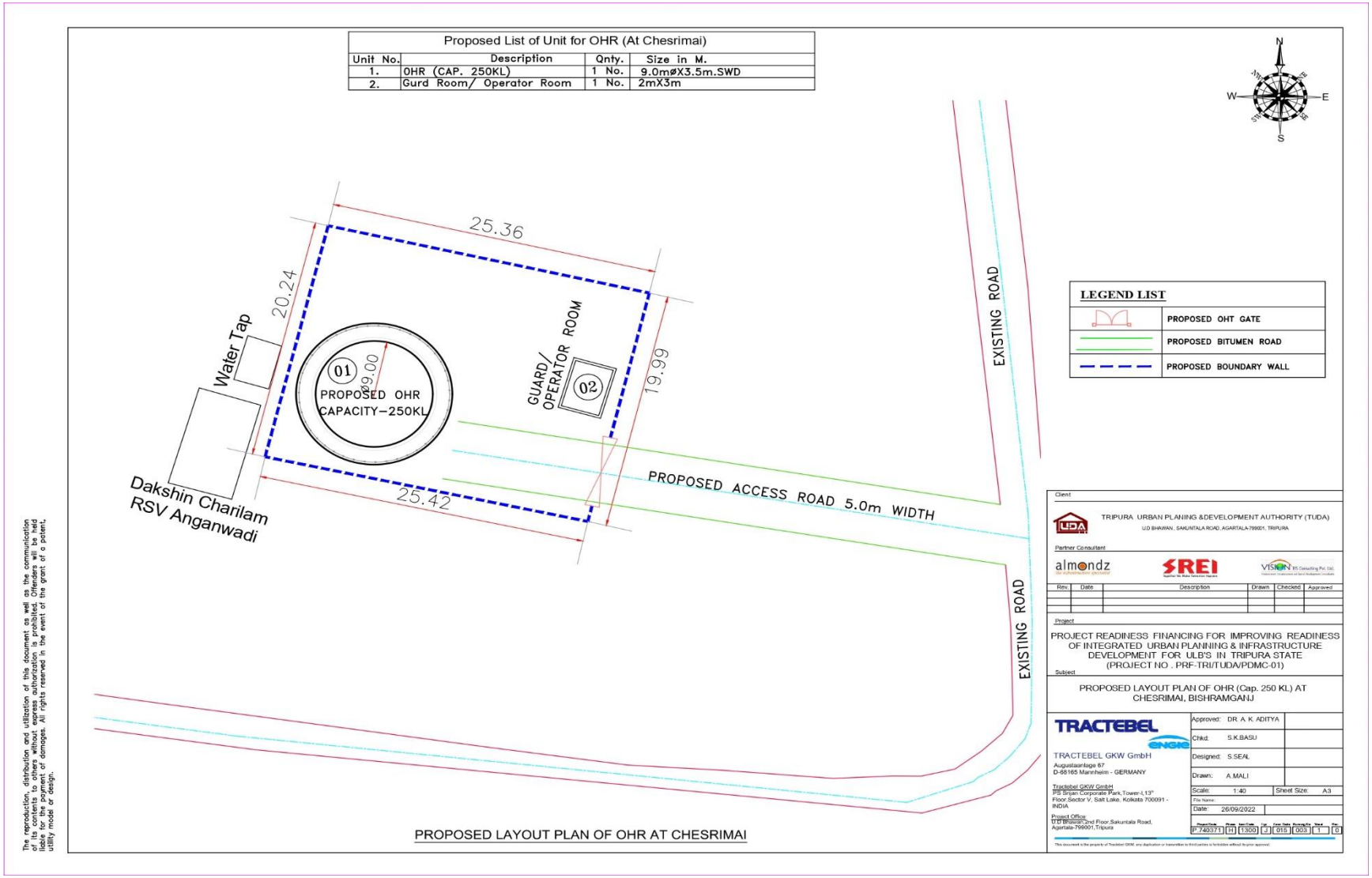


Figure 30: Layout Diagram of Proposed OHSR at Purba Barjala

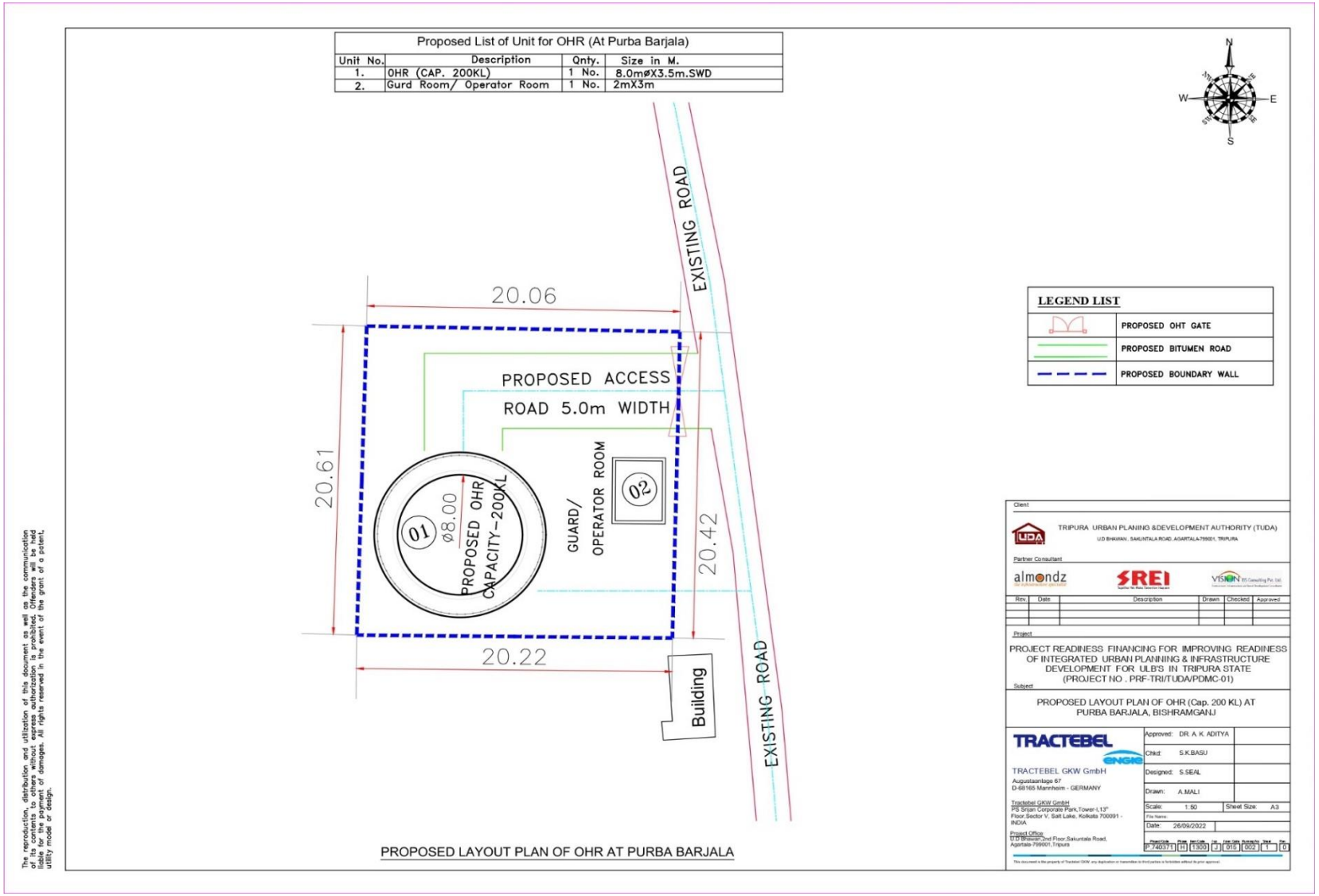
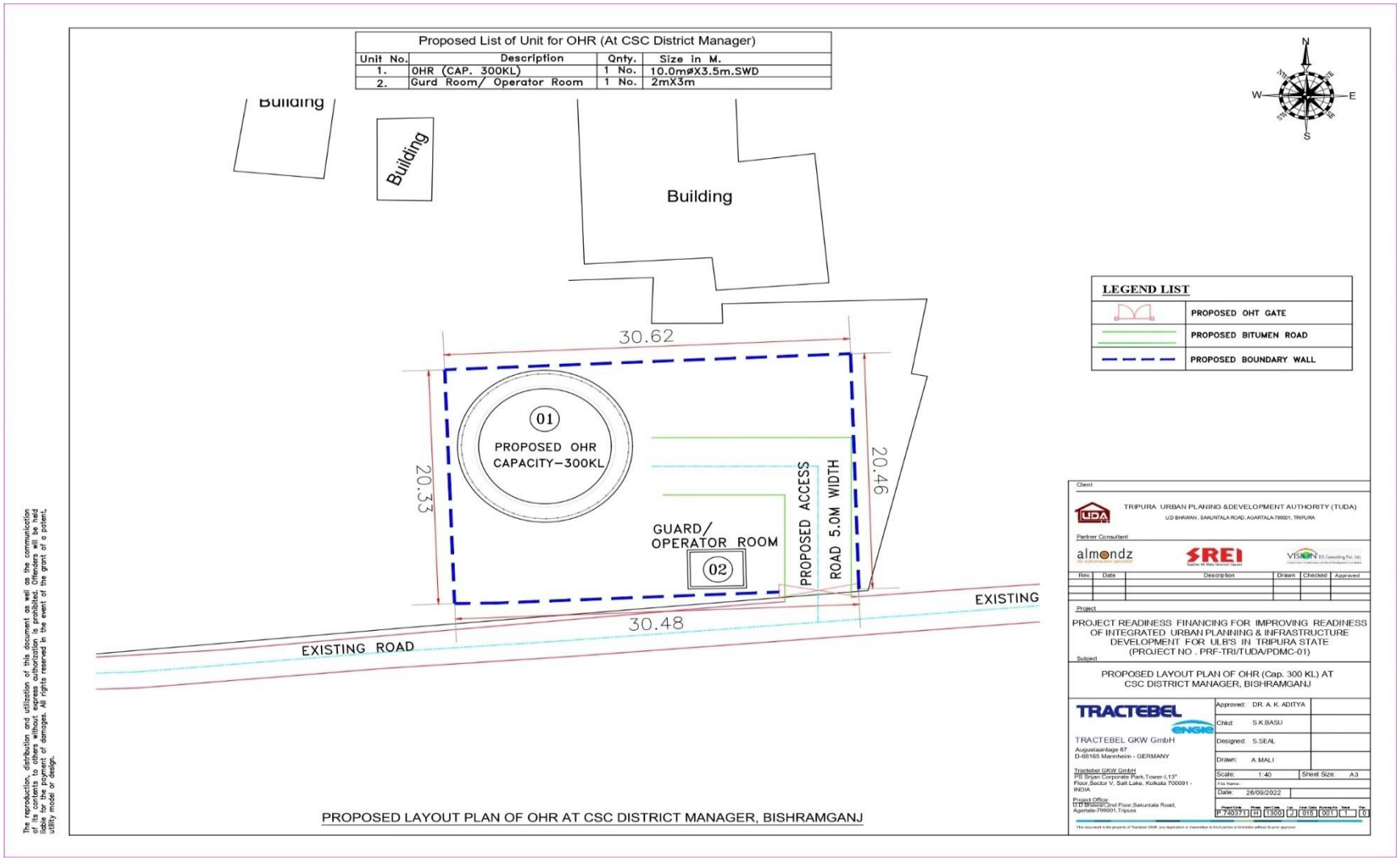


Figure 31: Layout Diagram of Proposed OHSR at CSC District Magistrate, Bishramganj



Existing and Proposed Water supply components Maps of Melaghar Town

Figure 32*:* Existing Water Supply Components in Melaghar on Google Earth

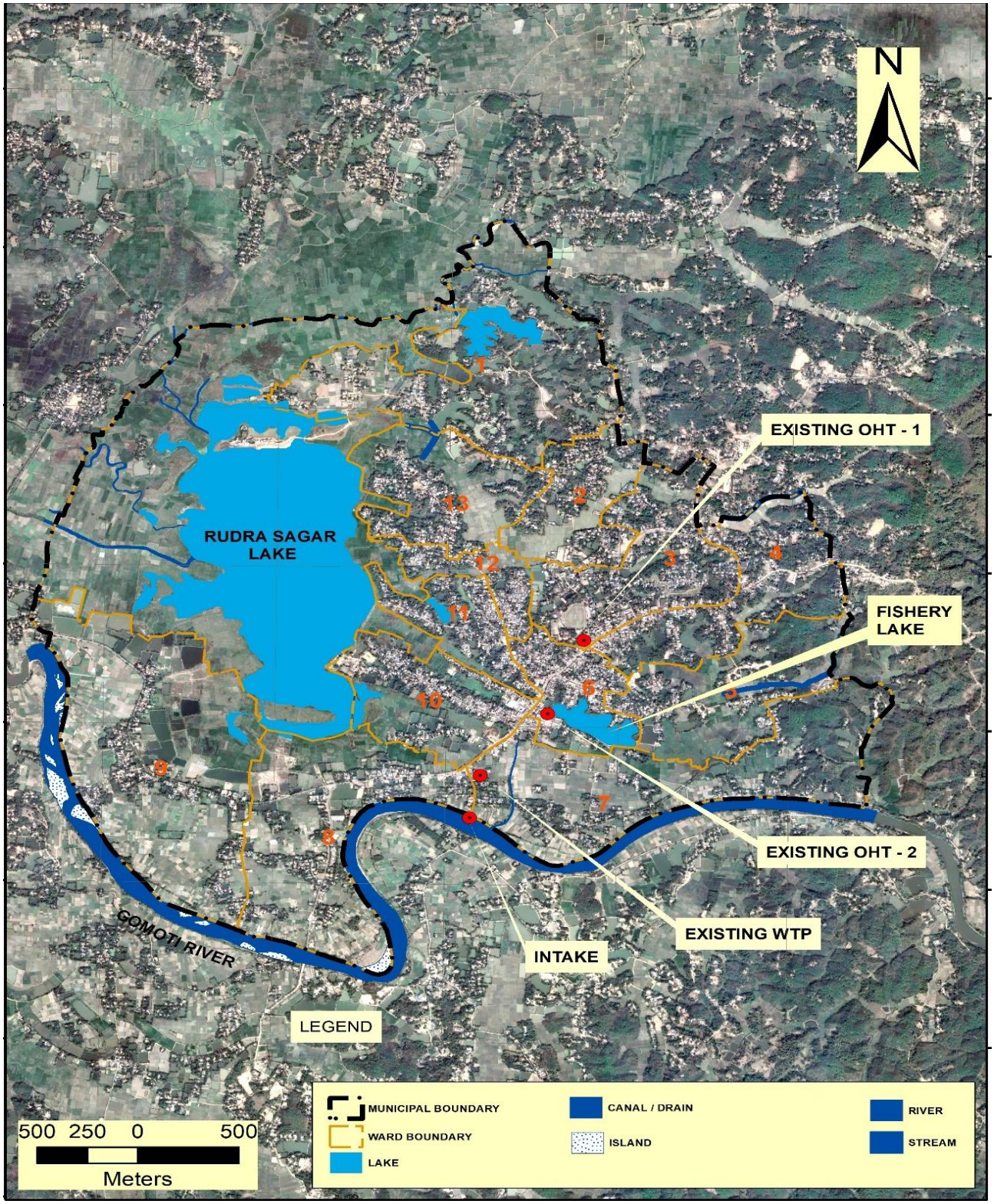


Figure 33: Proposed water supply components in Melaghar on google earth

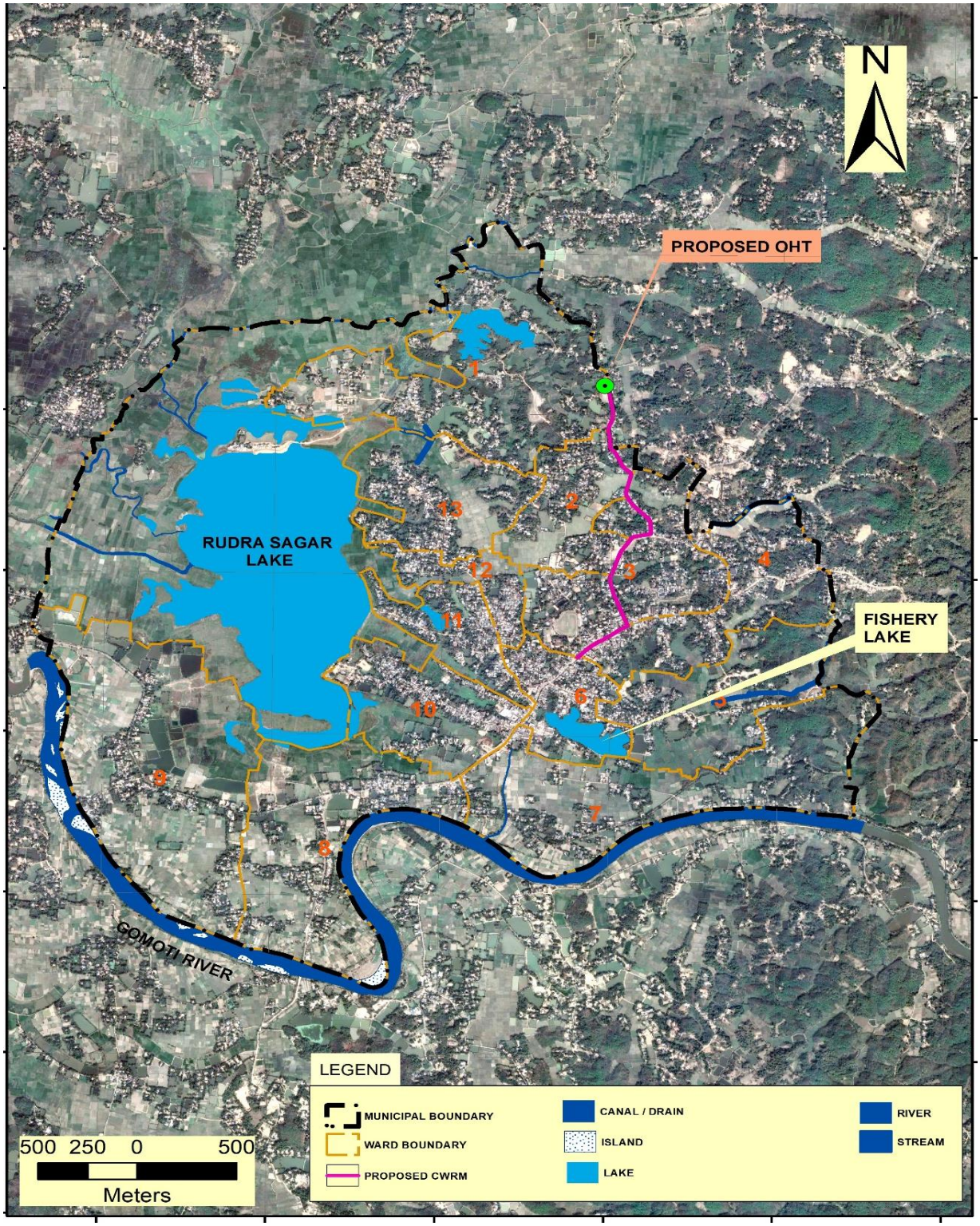


Figure 34*:* Existing Intake, WTP and surrounding areas in Melaghar on google earth

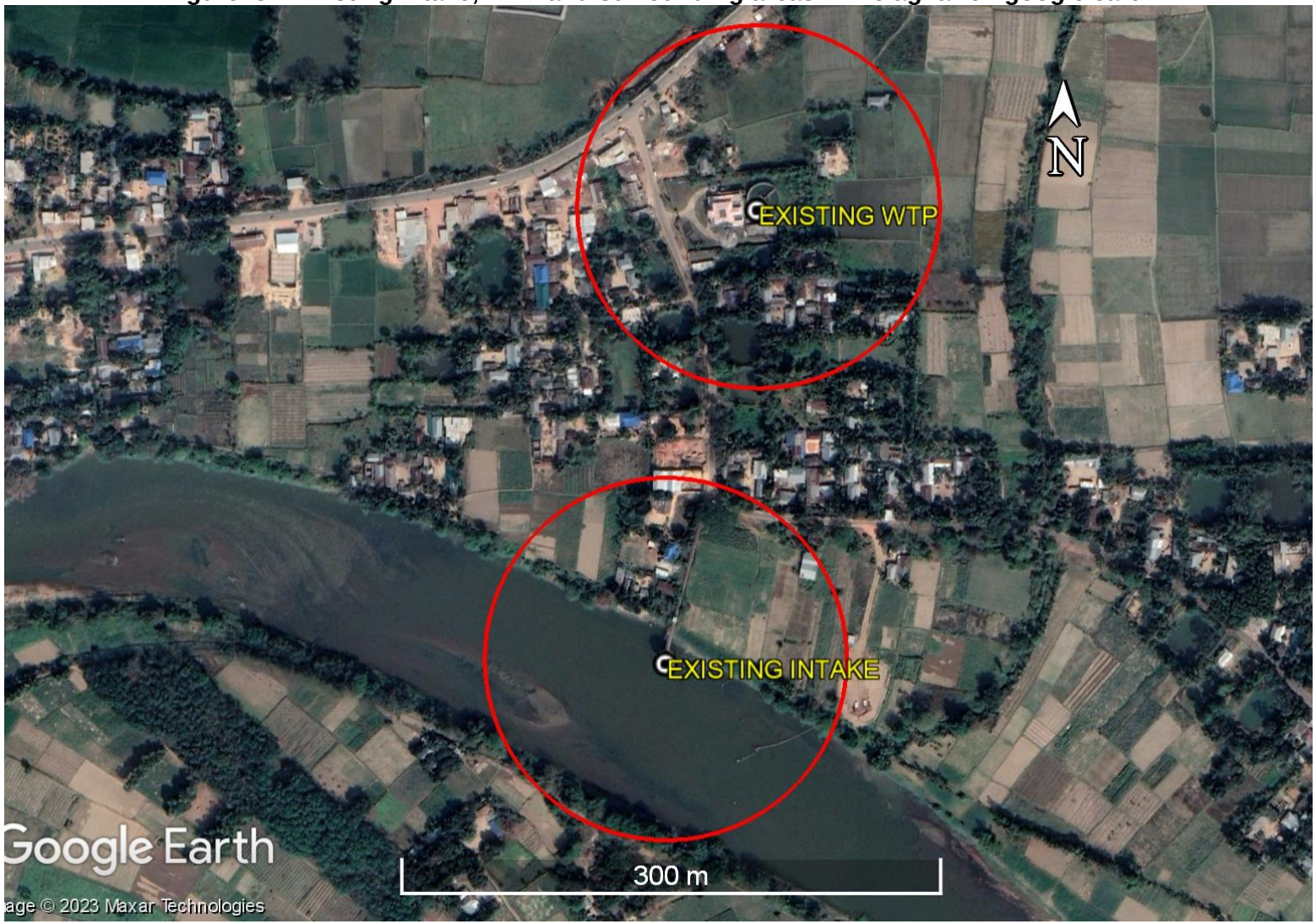


Figure 35: Proposed Clear water main and Reservoir locations

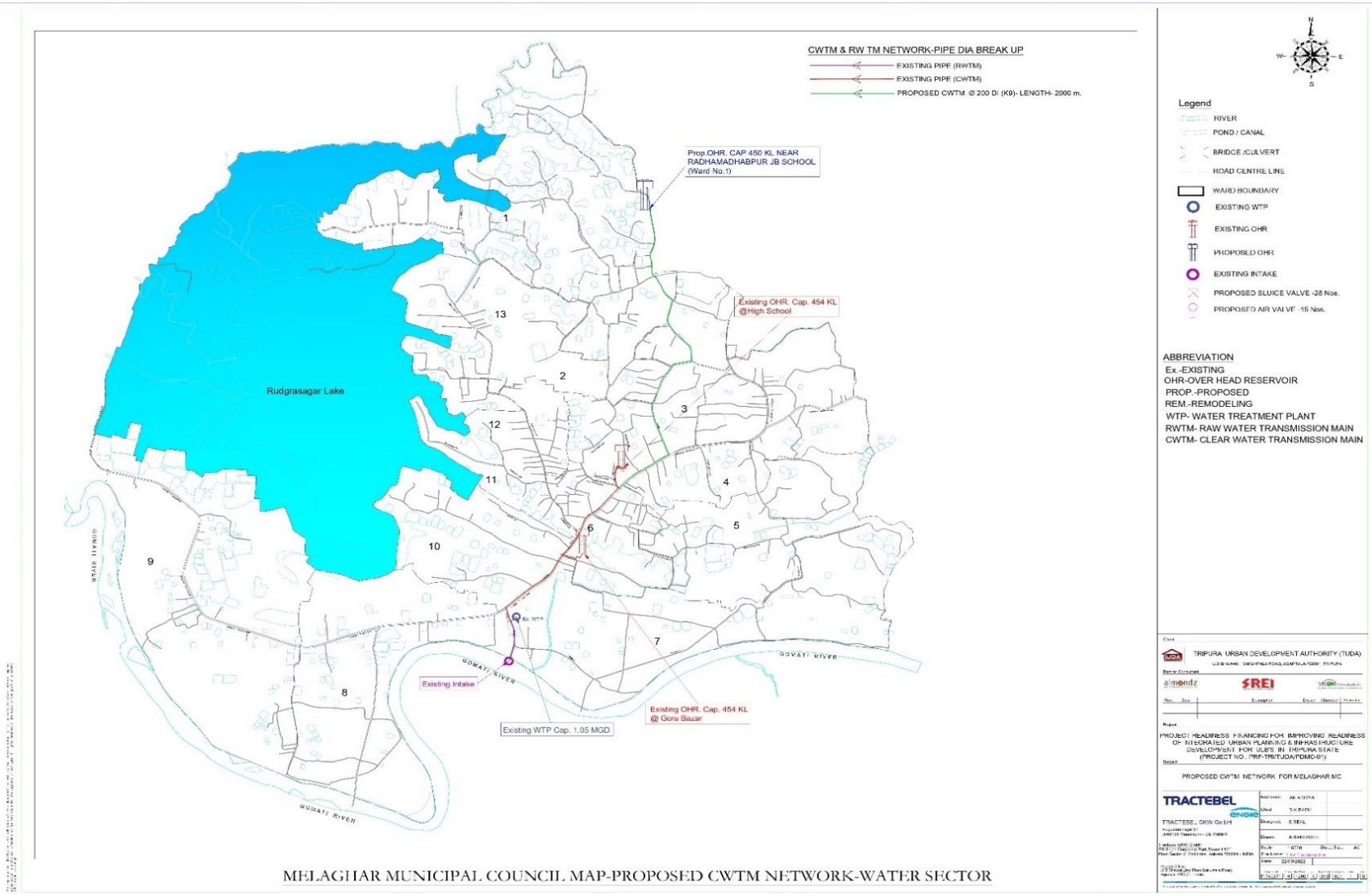


Figure 36*:* Proposed OHT location with 100m surroundings, Melaghar

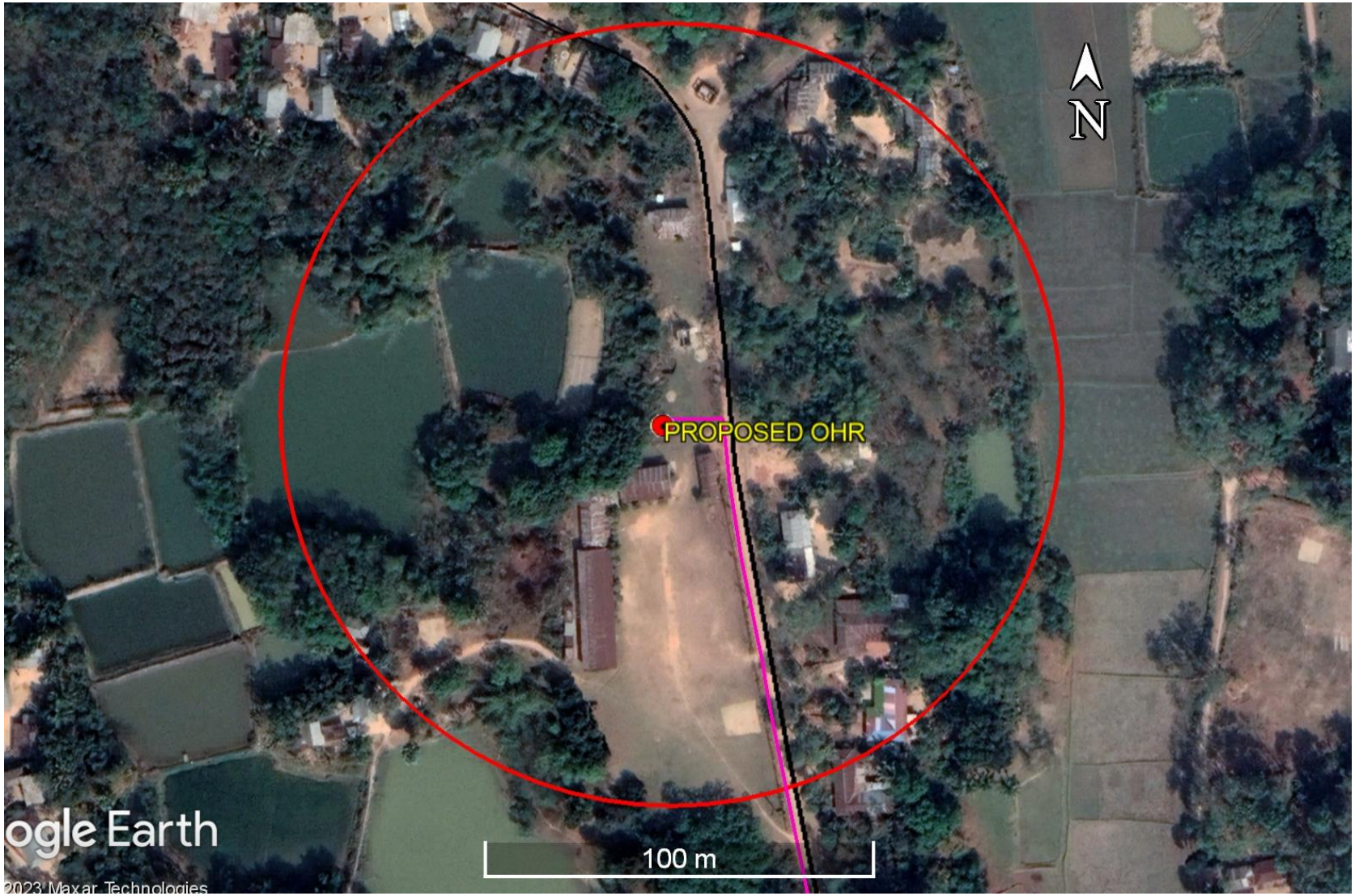


Figure 37: Proposed DMA area of Melaghar

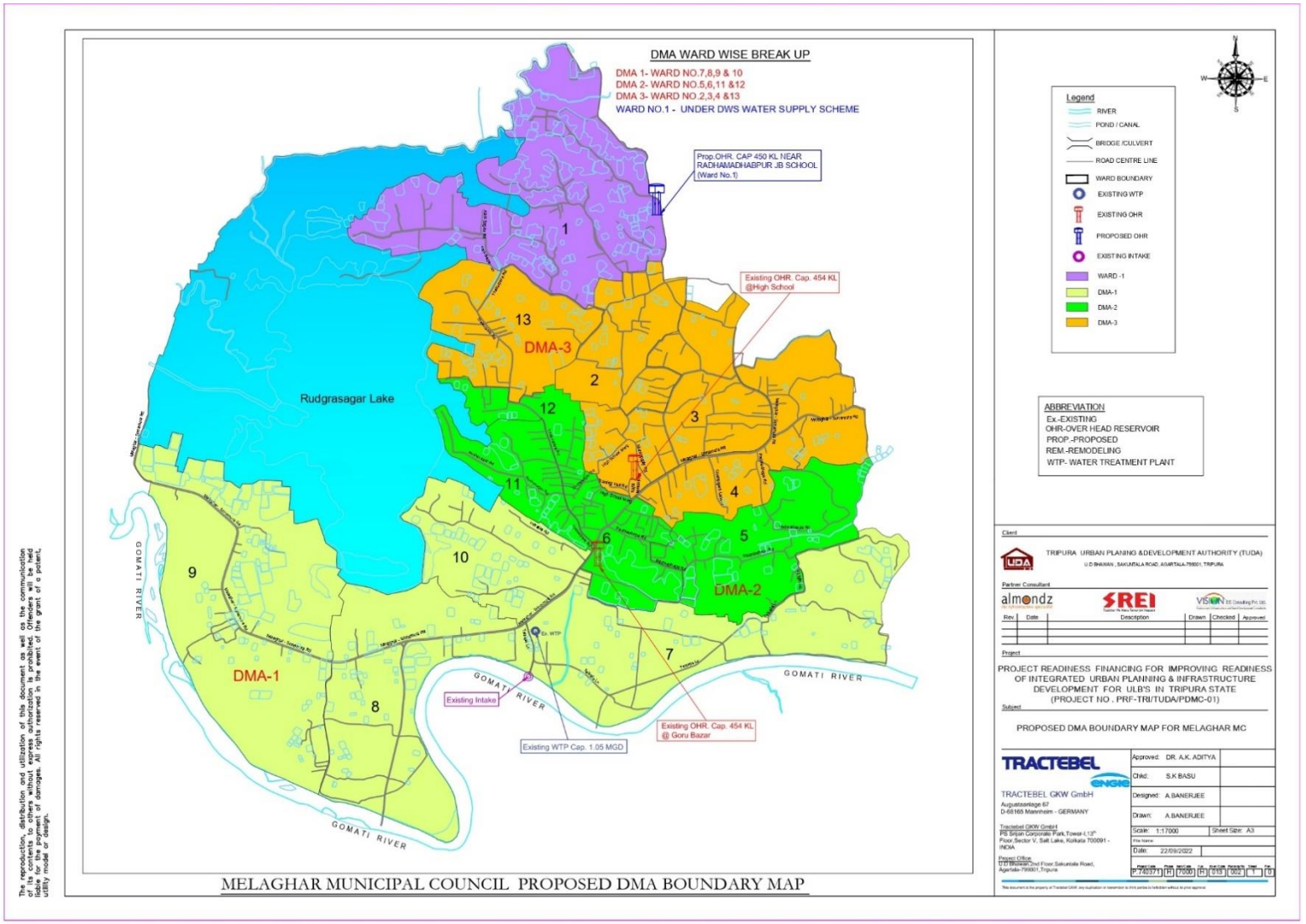


Figure 38: Water supply distribution network for Melaghar town

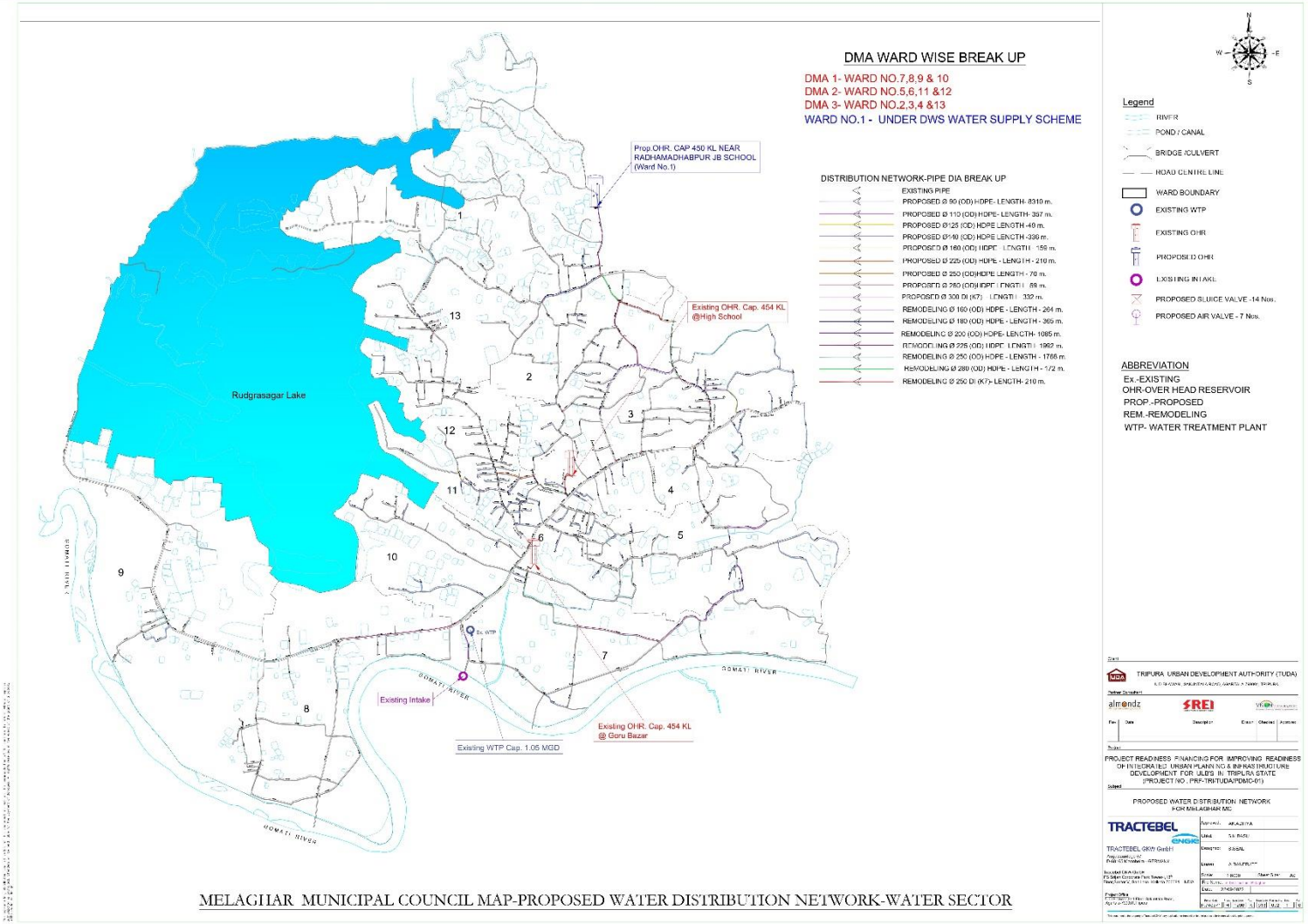
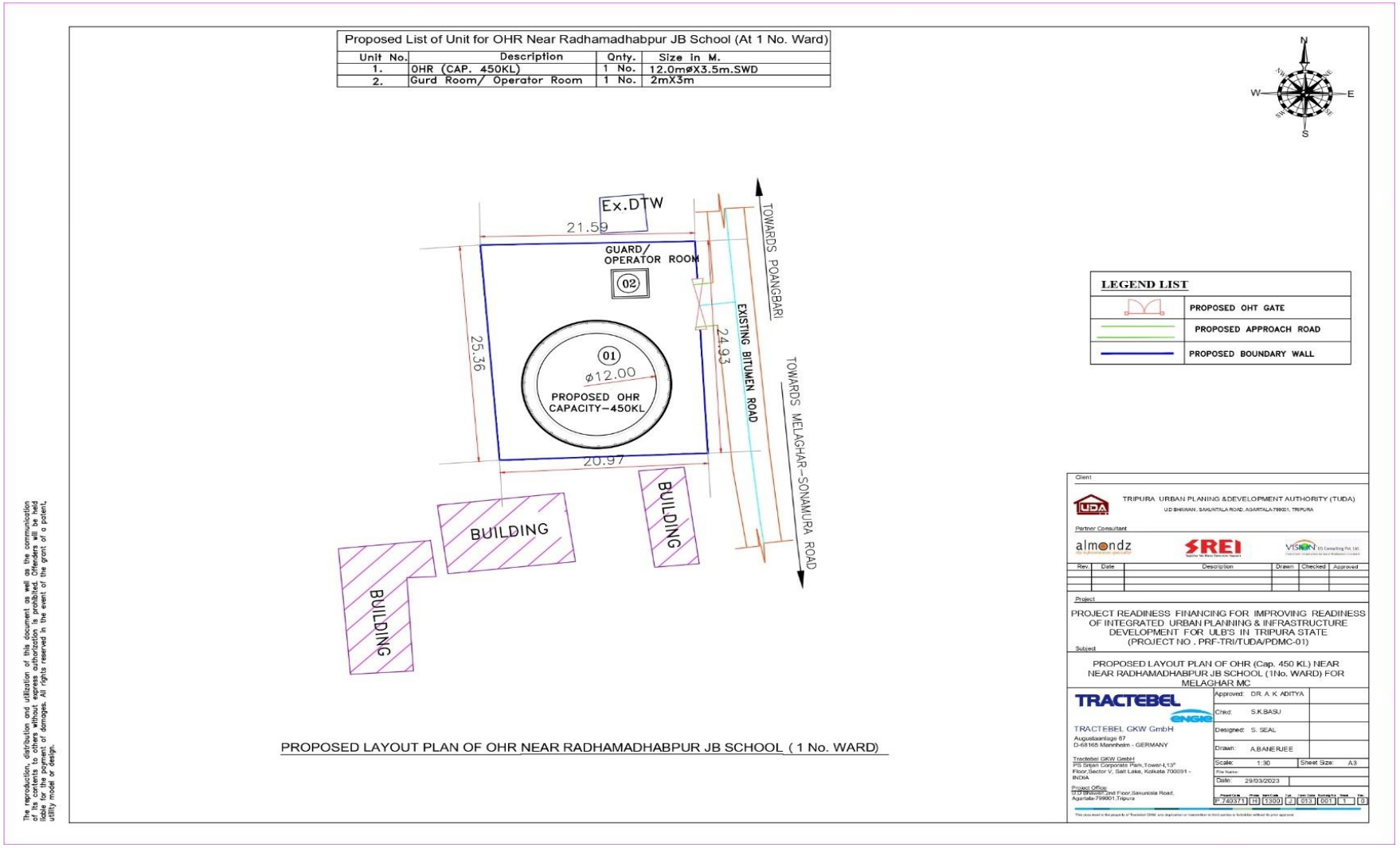


Figure 39: Layout Diagram of Proposed OHSR near Radhamadhabpur JB School (At Ward No. 1)



Existing and Proposed Water supply components Maps of Belonia town

Figure 40: Existing water supply components in Belonia on google earth

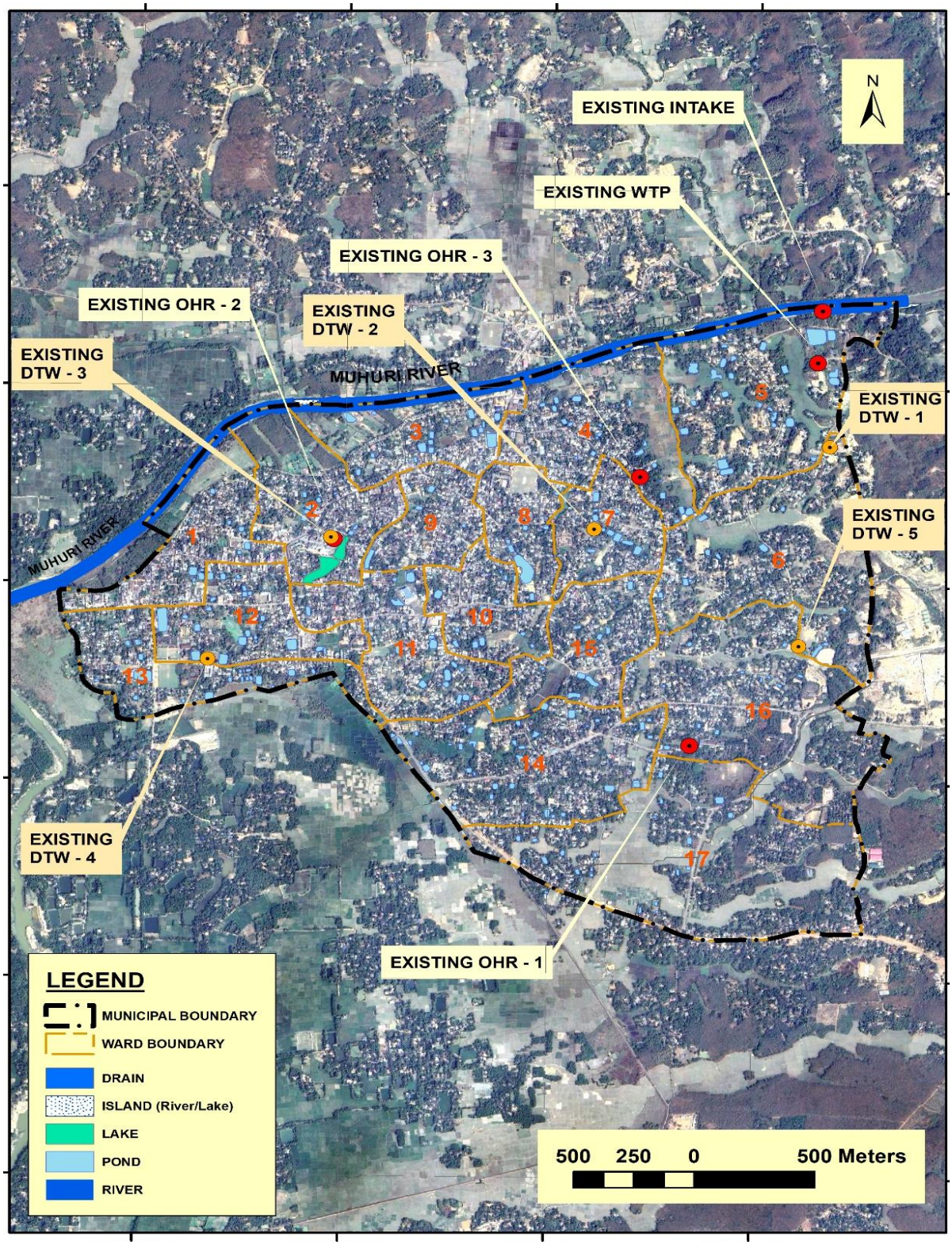


Figure 41: Proposed water supply components in Belonia on google earth

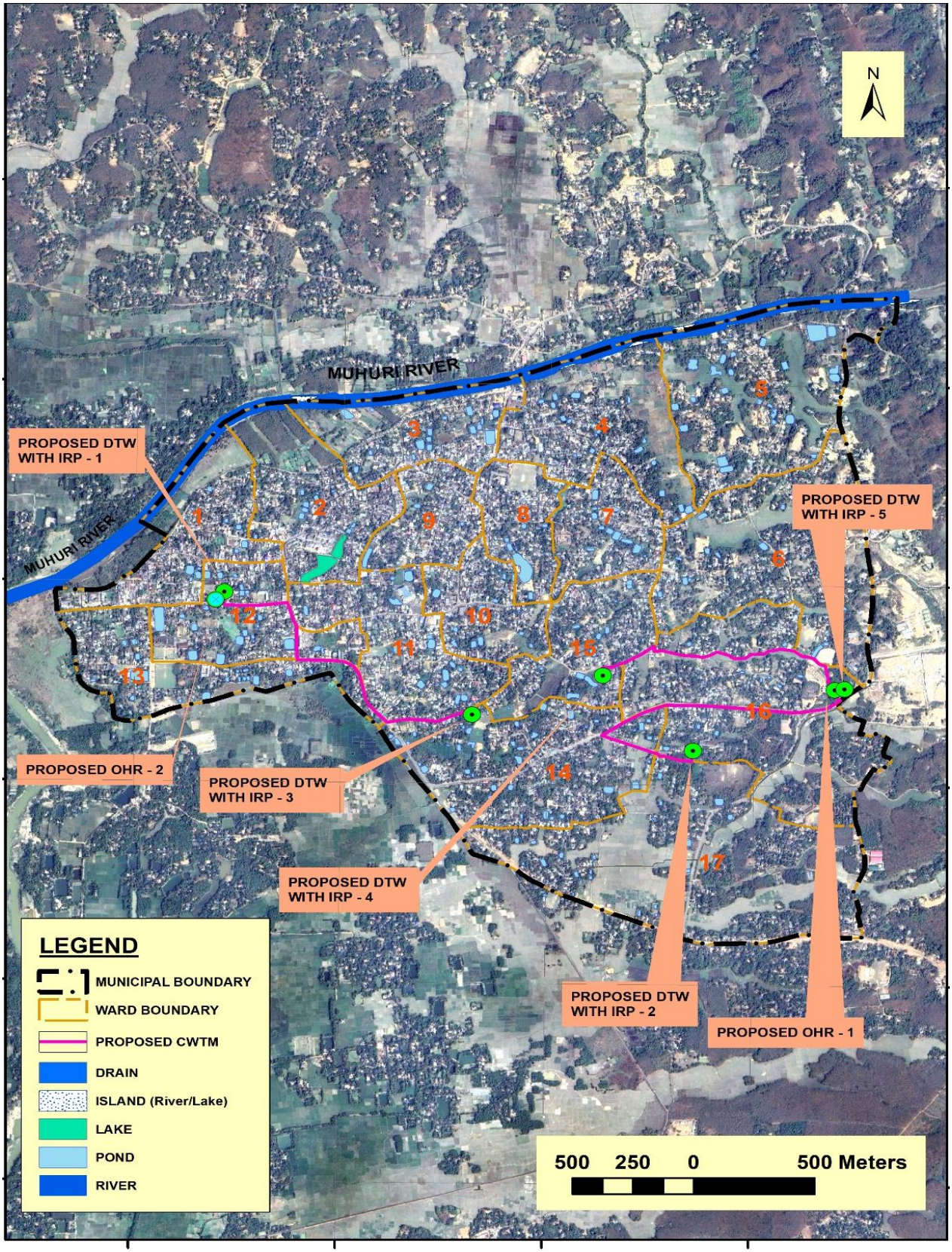


Figure 42: Existing Intake WTP and surroundings in Belonia on google earth

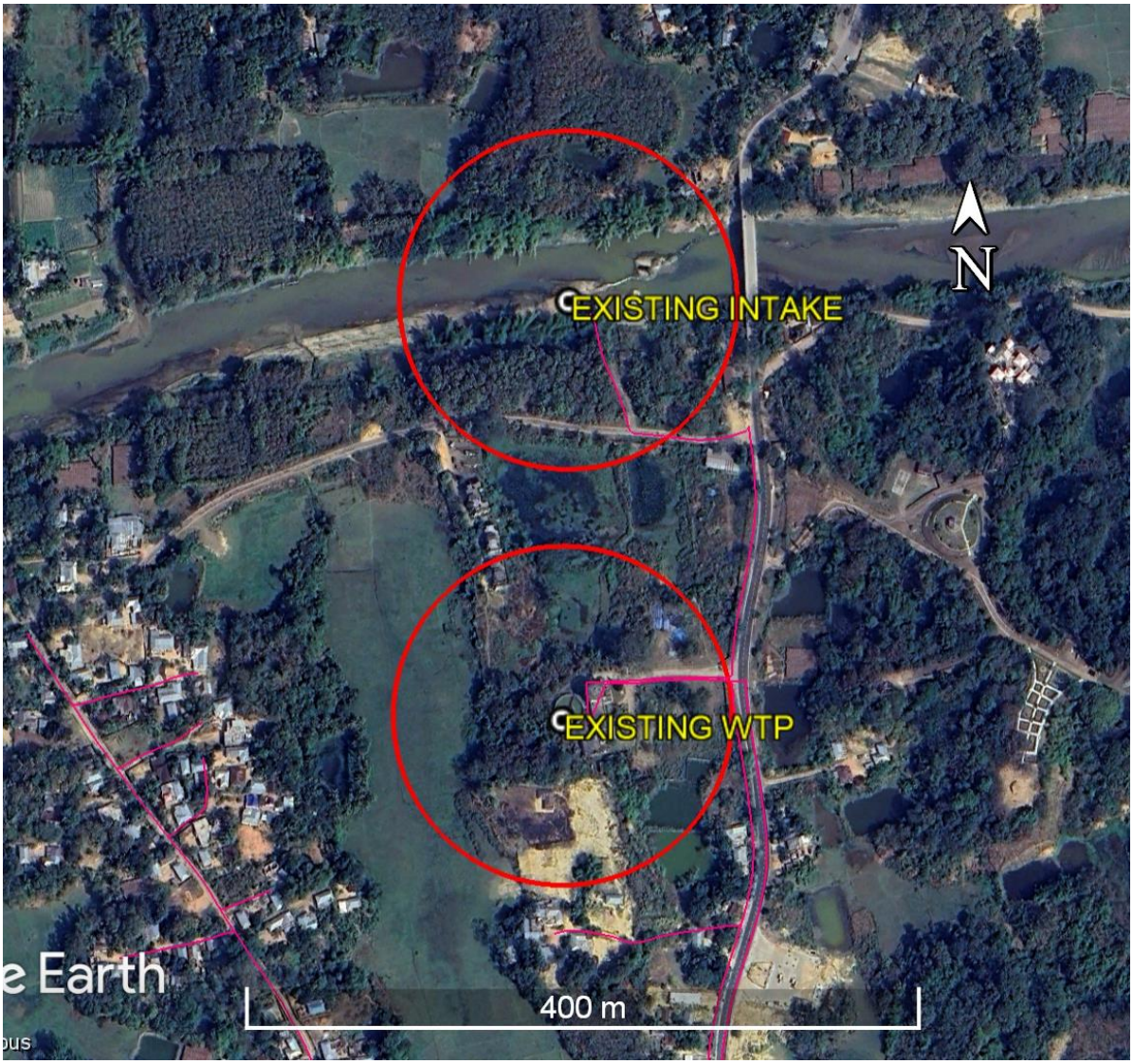


Figure 43: Proposed CWTM network at Belonia Town

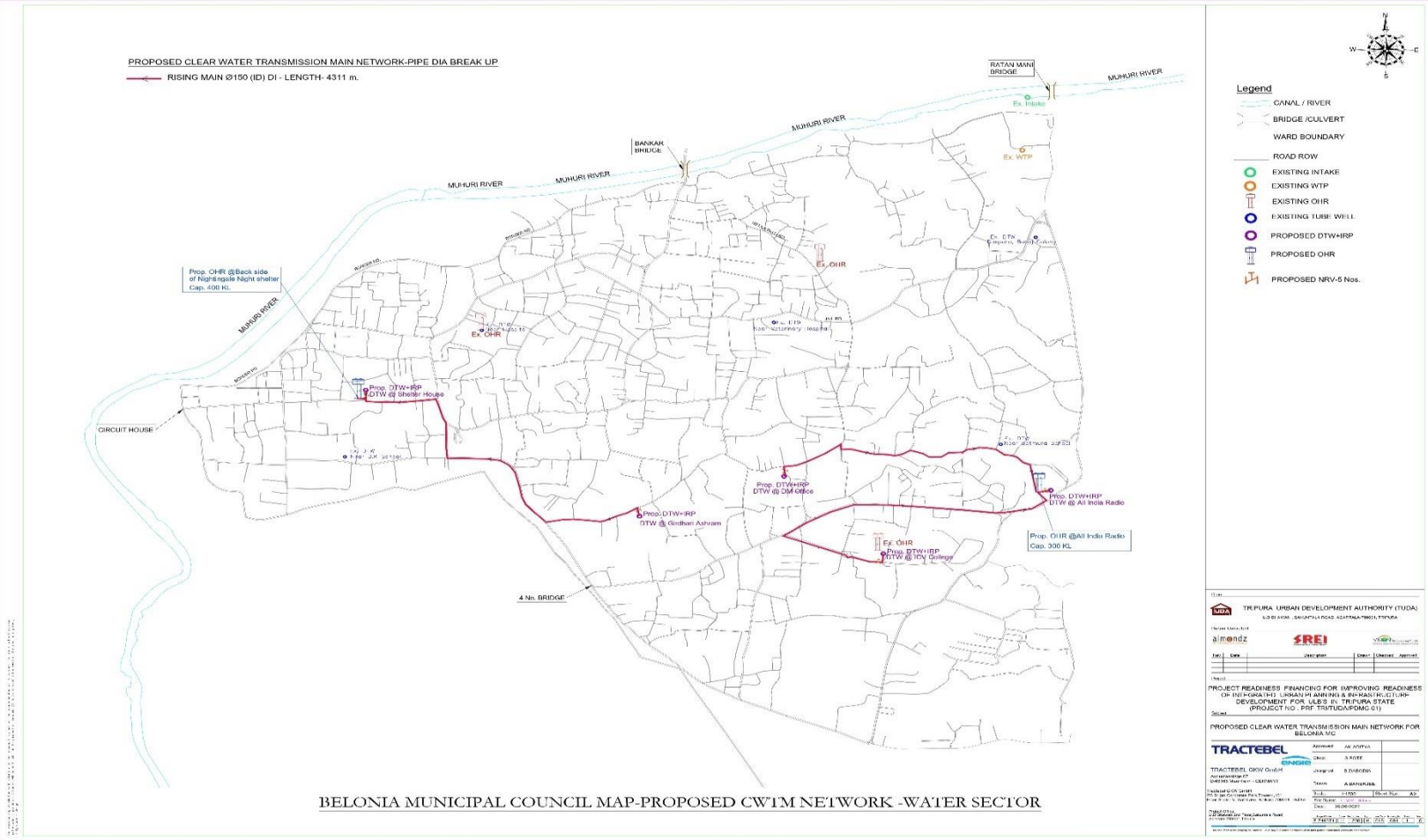


Figure 44: Proposed OHT 2, DTW and IRP 1 Backside of Nightangle Shelter house

Figure 45: Proposed OHT 1, DTW & IRP 5- near All India Radio

Figure 46*:* Proposed DTW & IRP 2 in ICV College

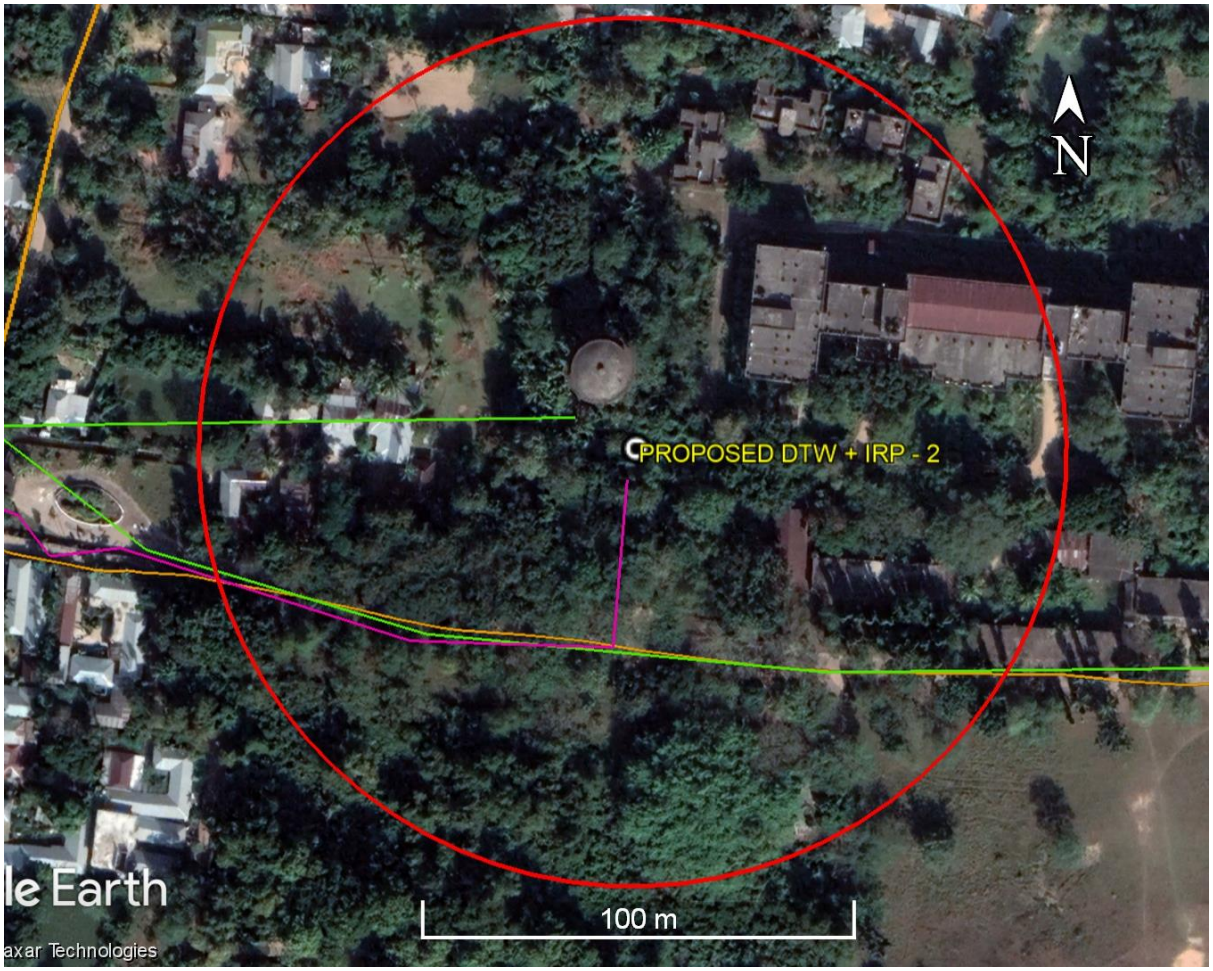


Figure 47*:* Proposed DTW & IRP 3 near Giridhari Ashram

Figure 48*:* Proposed DTW & IRP 4 near DM Office

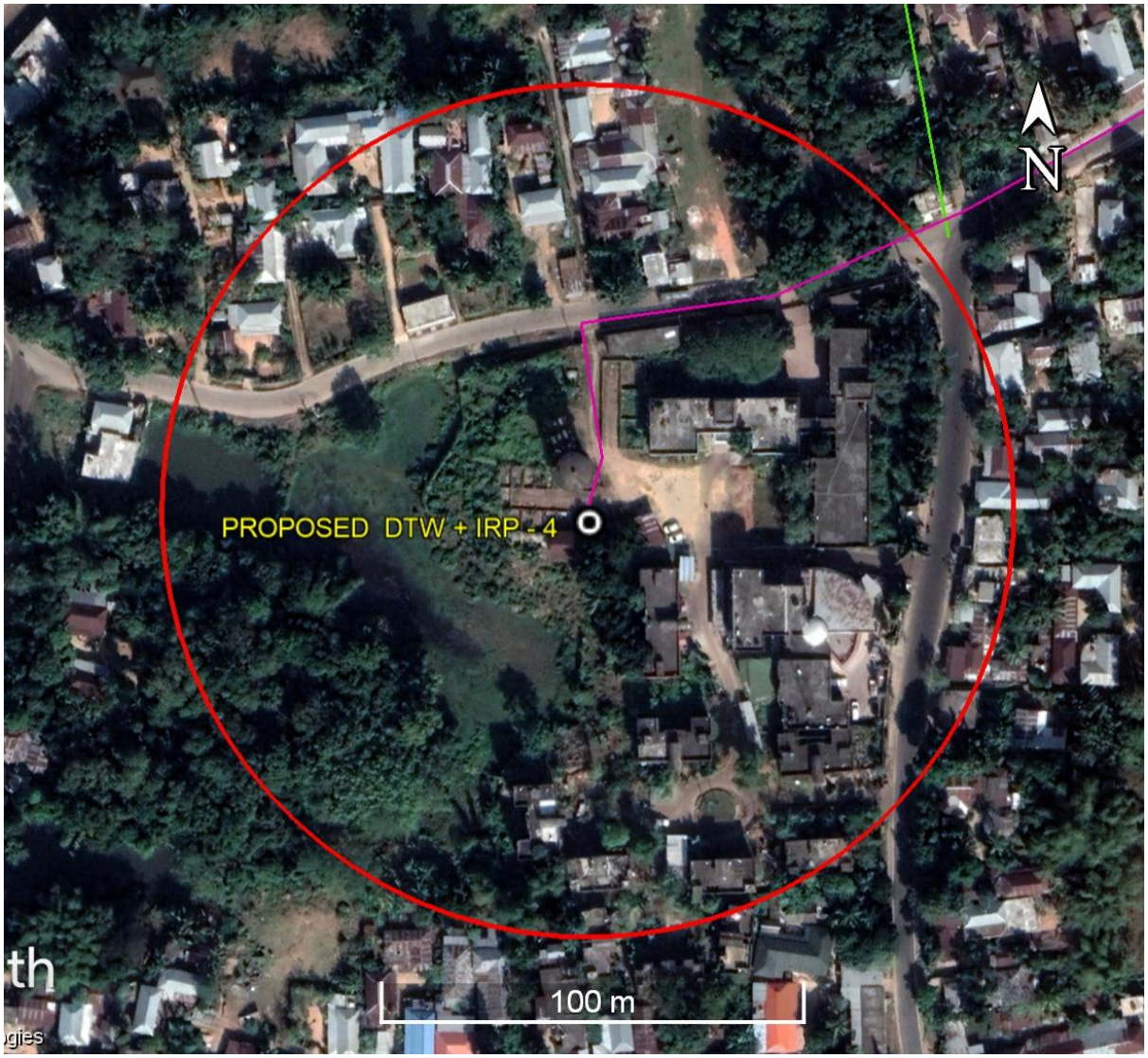


Figure 49: Proposed DMA map of Belonia

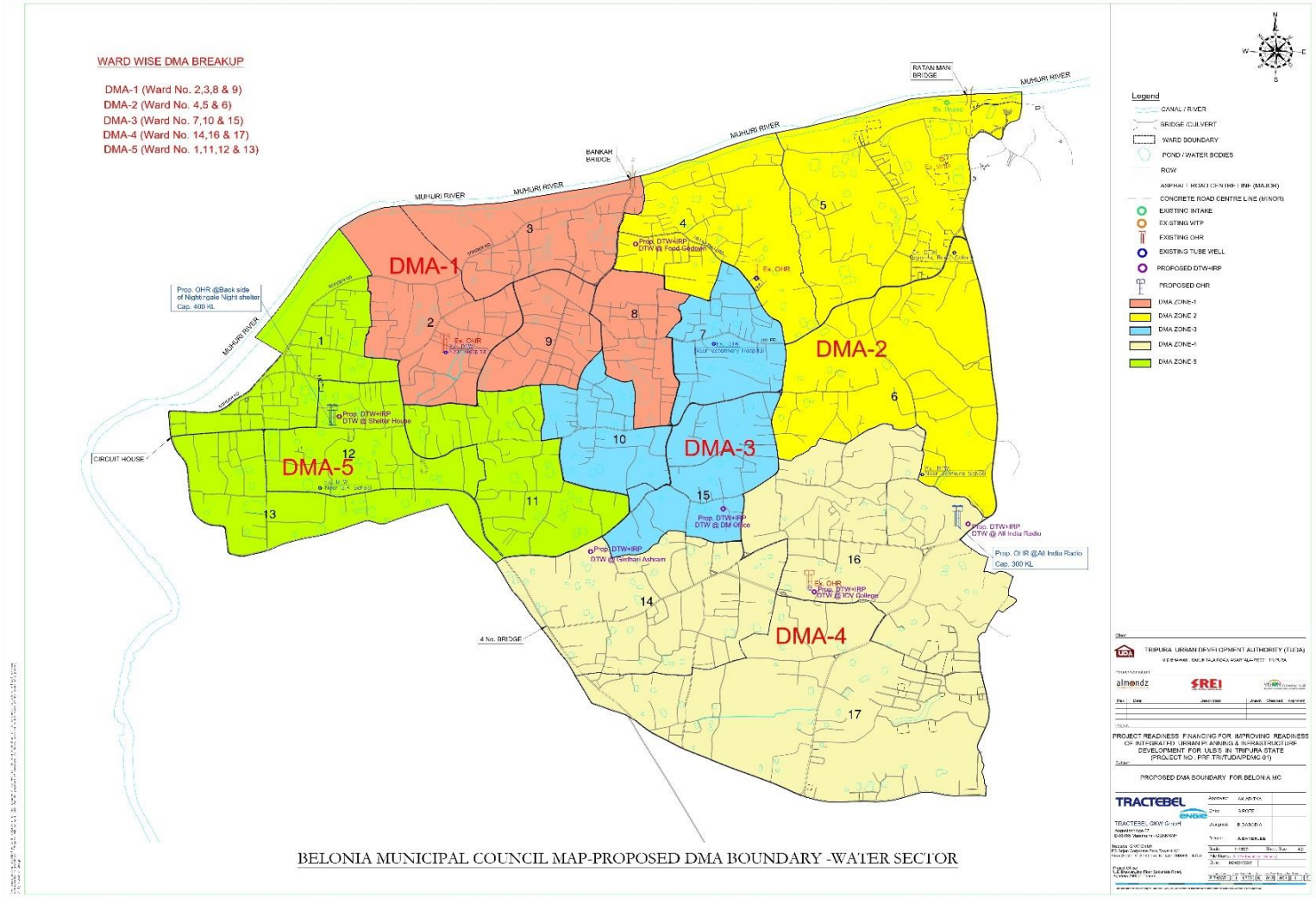


Figure 50: Proposed water supply distribution network at Belonia

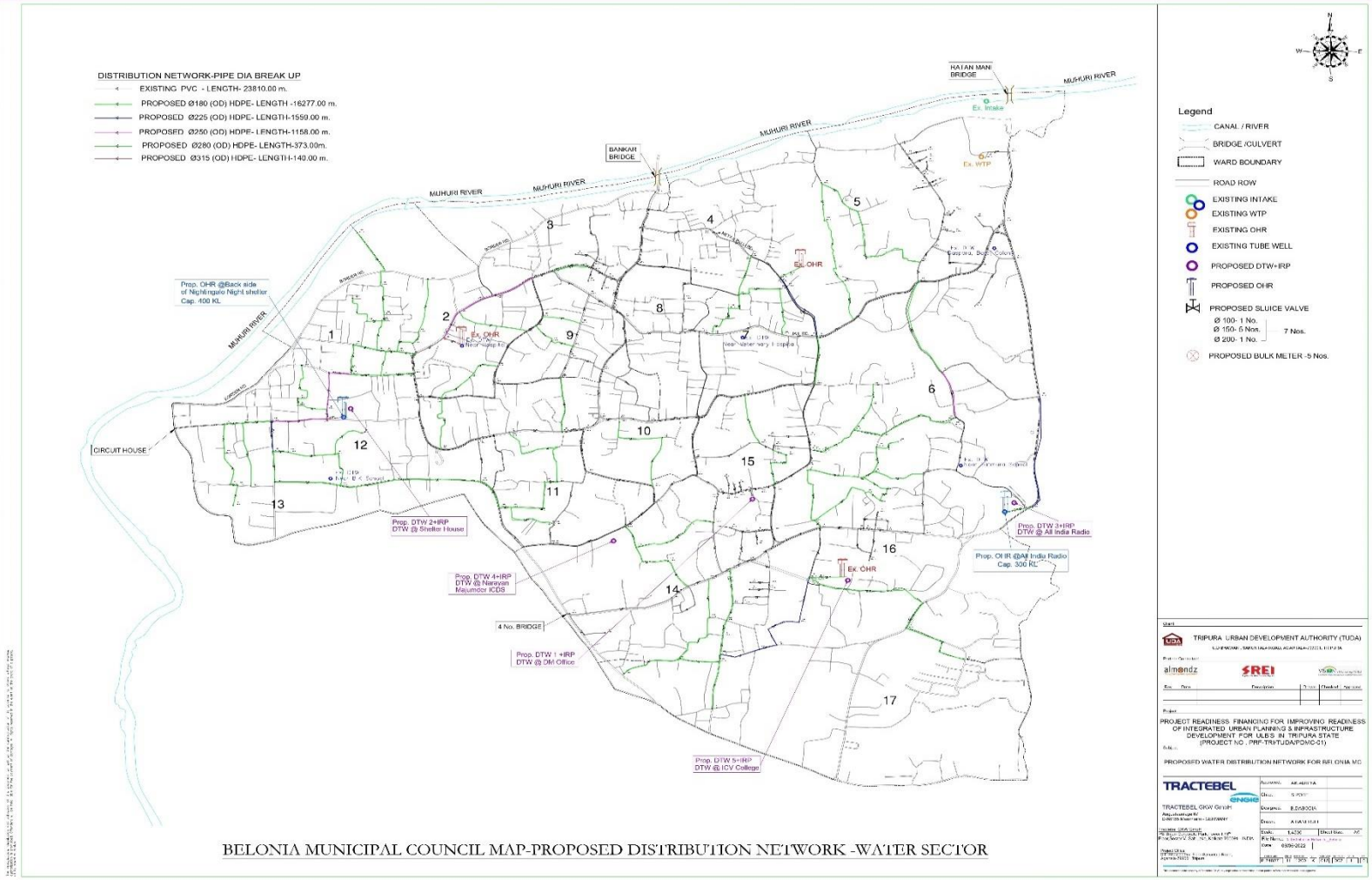


Figure 51: Layout Diagram of Proposed OHR, DTW and IRP near Nightangle Shelter House

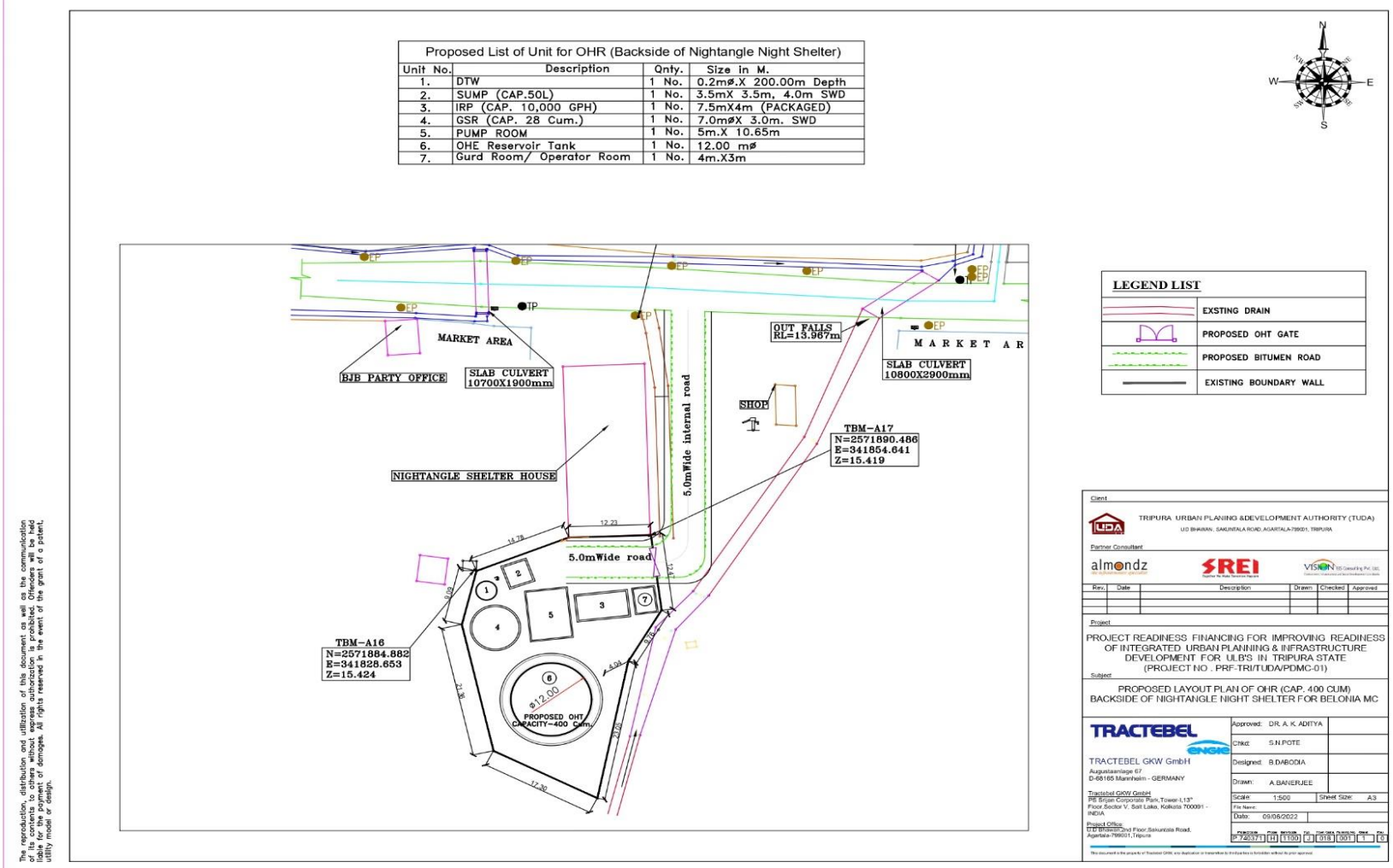


Figure 52*:* Layout Diagram of Proposed OHR, DTW and IRP near All India Radio Station

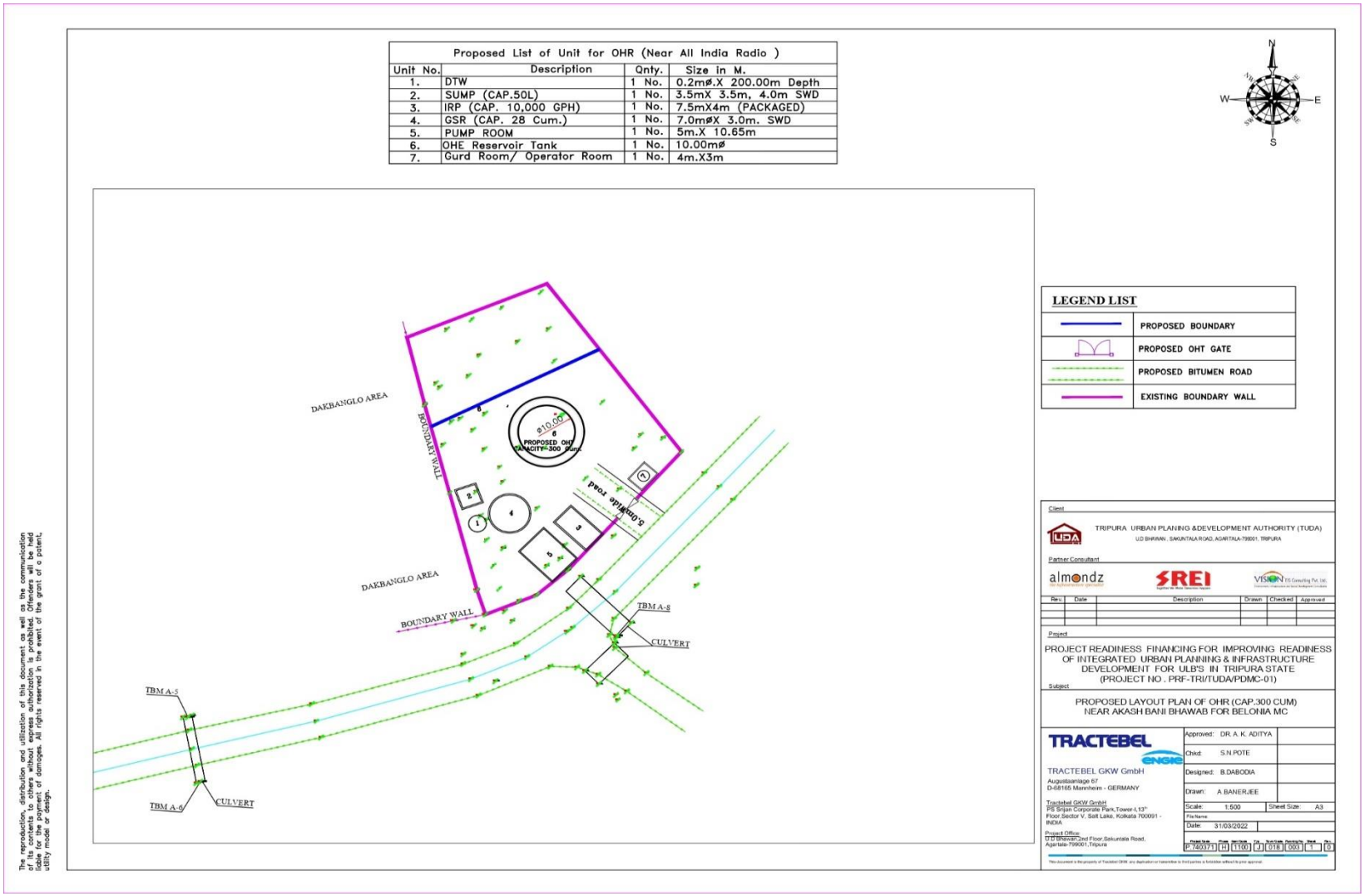


Figure 53: Proposed DTW with IRP layout Plan near Giridhari Ashram

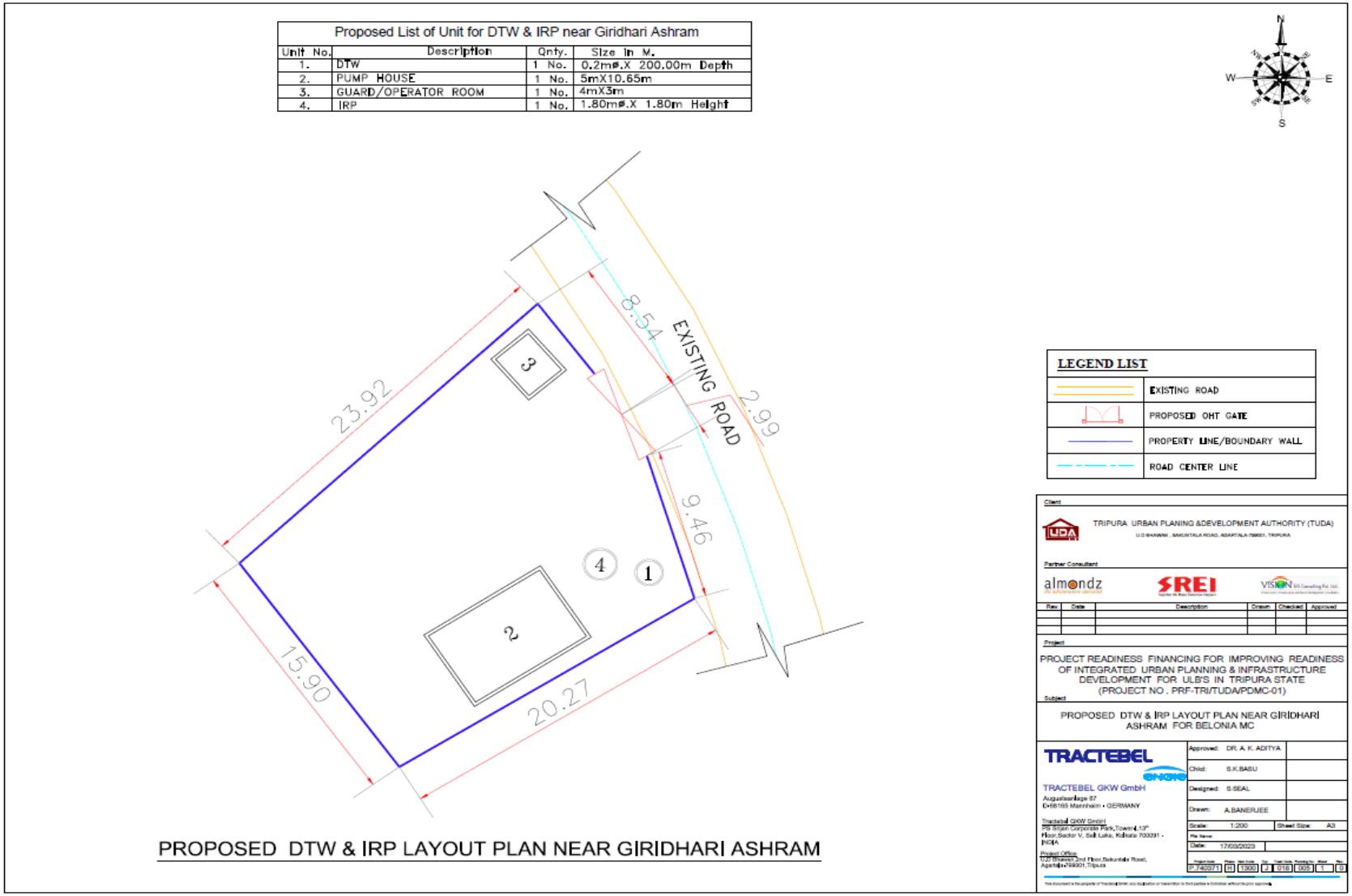


Figure 54: Proposed DTW with IRP layout Plan near DM office

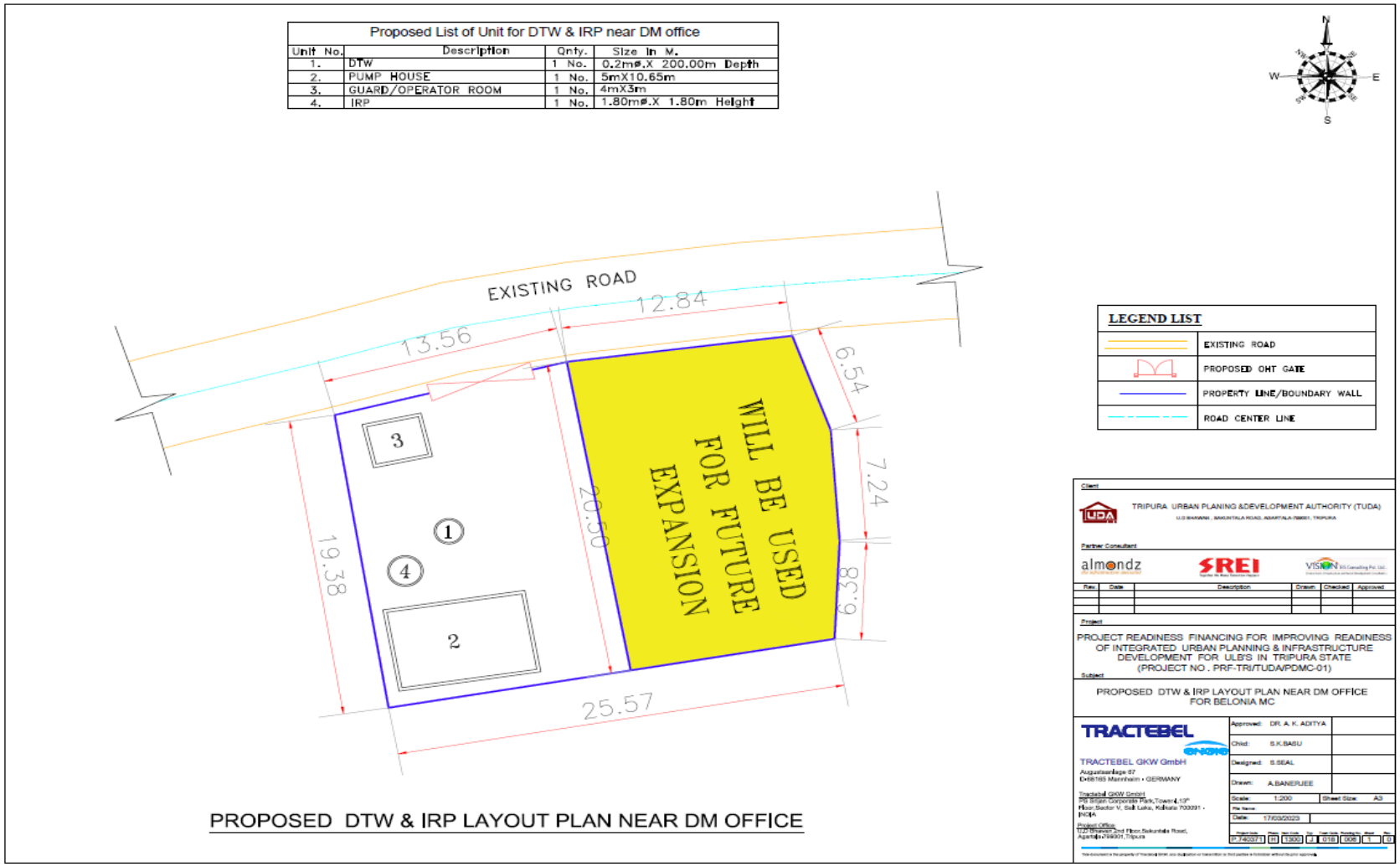
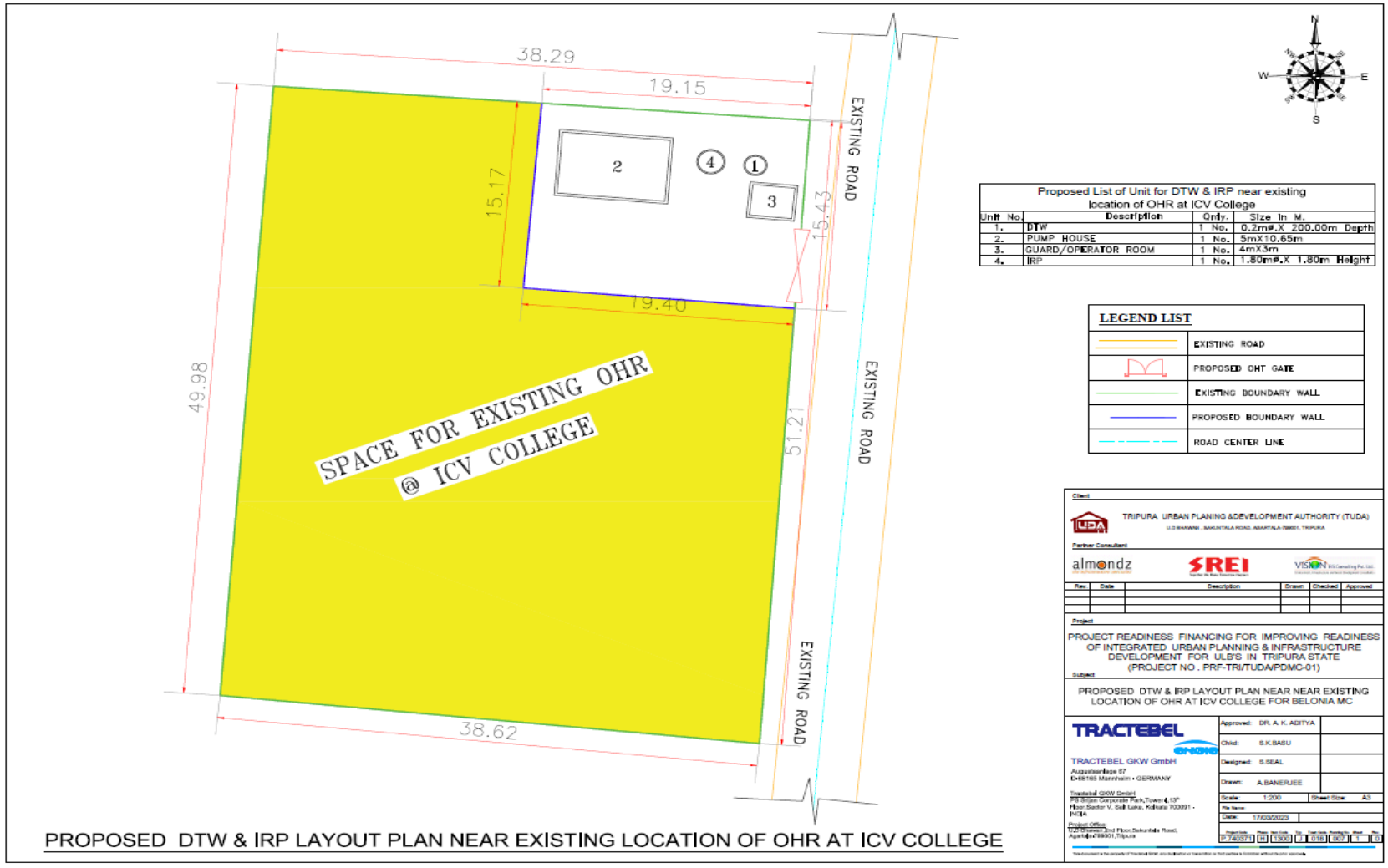


Figure 55: Proposed DTW with IRP layout Plan at ICV College



III. ANALYSIS OF ALTERNATIVES

34. Descriptions of various alternatives considered for critical components such as water source, water treatment and distribution etc. are presented in the table below.

1.	**Project Need – No Project Alternative**
Type of alternative	**'No project' / 'with project' alternative**
Description of alternatives	**No project alternative –** At present water supply is being served below 100% of the total town area, Some of existing civil structures such as storage reservoirs and other ancillary structures are not in good condition. Few reservoirs are not adequate to meet the ultimate water demand and those are meeting need repairing of civil structures. In present distribution network the tail end consumers are not getting the enough terminal pressure and discharge. Distribution of water is through distribution reservoir and only by gravity process. The schemes are manually operated and lacking in monitoring of real time quality and quantity of water supplied. Therefore, it could be stated that unaccountable flow of water in the system is very high. Living conditions due to absence of proper water supply, are unhealthy and unhygienic. Lack of infrastructure is also causing environmental pollution, overall poor quality of life. Poor environmental quality affects the urban poor people more. The project intends to provide following benefits to the people residing in the subproject area, and the "no project" alternative will deprive people of these benefits: • Increased availability of potable water at appropriate pressure to all households including urban poor • Reduced time and costs in accessing alternative sources of water. • Better public health particularly reduction in waterborne and infectious diseases; • To ensure positive impact on social status and economic standard of the people of rural areas. • To automate the operation from source to sector tank with use of SCADA and water quality monitoring • Ensure that 100% households have a metered water connection, **With project alternative** Since the existing water supply sources/systems are insufficient to accommodate growing population in the area, the proposed water supply subproject includes source augmentation to provide adequate water, water conveyance, treatment, storage, and distribution. The successful implementation of the water supply project will result in better control over the drinking water management, improved monitoring system and overall demand management along with energy reduction. Overall, **'with project alternative'** will bring about improved public health and living environment that will contribute to improved quality of life in this area. Improved water supply system will create an enabling environment for local economic development.
Selected Alternative	"Without" subprojects would yield the project area to be continuously under-serviced that puts the health of the general public at an increasing risk and could potentially worsen the living environment. This 'no project' scenario would impede further social and economic development of the district and the defer commitments to improve the proportion of the population with sustainable access to clean water. Given the large-scale benefits to the population and environment, '**With Project'** alternative is considered appropriate.

2.	**Alternative source of water**
Type of alternative	**'Water source'**
	<u>Udaipur</u> **Groundwater:** Presently source of water at Udaipur town is from Gomati River followed a water treatment plant and 10 no. Deep Tube well (DTW) are the main sources of piped water supply in the town. Presently total water abstracted from Tube Wells is approximately 1.57 MLD. **Surface Water:** At present there is a wet type of Intake well of utilized capacity 4.72 MLD (5 m dia., commissioned in 1997) located on Gomati River and approx. 400 m away from the 5.9 MLD capacity WTP to draw surface water. Gomati River is a semi-perennial source of water. Due to low availability of water depending entirely on surface water supply is considered unsustainable. **Combined ground and surface source – adoption of conjunctive use:** Either the groundwater or surface water is not able to fulfil the projected town demand, and therefore it is designed to utilize both the source optimally. Given less than 100% dependability of Surface water, in the low rainfall years, the deficit from the river Gomati will be met by tube wells and accordingly the water abstraction from groundwater sources will be increased as required. **<u>Amarpur</u>** **Groundwater:** Presently source of water at Amarpur town is from Gomati River followed a water treatment plant and 2 no. Deep Tube well (DTW) are the main sources of piped water supply in the town. Presently total water abstracted from Tube Wells is approximately 0.28 MLD. **Surface Water:** At present there is a wet type of Intake well of utilized capacity 2.95 MLD (5 m dia., commissioned in 2007) located on Gomati River and approx. 300 m away from the 2.95 MLD capacity WTP to draw surface water. Gomati River is a Semi-perennial source of water. Due to low availability of water depending entirely on surface water supply is considered unsustainable. **Combined ground and surface source – adoption of conjunctive use:** Either the groundwater or surface water is not able to fulfil the projected town demand, and therefore it is designed to utilize both the source optimally. Given less than 100% dependability of Surface water, in the low rainfall years, the deficit from the river Gomati will be met by tube wells and accordingly the water abstraction from groundwater sources will be increased as required. **<u>Bishramganj</u>** **Ground water source:** The present water supply to the town is from 9 tube wells that are located across the town. As per the gap analysis additional 0.86 MLD of raw water is required for Bishramganj for the design year 2038. Installation of pump and pump house for 6 nos. Deep Tube Well (DTW) at 6 different locations which are already sunk by DWS). The available ground water yield of Bishramganj town ranges from 50-100 m^3/hr. The proposed 6 tube wells may withdraw water considering sustainable discharge with 60% safety. Hence it can be concluded that the proposed sources are capable to meet projected water demand and sustainable for this proposed water supply project till ultimate design year (2053).

	Melaghar **Groundwater:** Presently source of water at Melaghar town is from Gomati River followed a water treatment plant and 8 no. Deep Tube well (DTW) are the main sources of piped water supply in the town. Presently total water abstracted from Tube Wells is approximately 0.43 MLD. **Surface Water:** At present there is a wet type of Intake well of utilized capacity 4.77 MLD (5 m dia., commissioned in 2011) located on Gomati River and approx. 300 m away from the 1.05 MGD/ 4.77 MLD capacity WTP to draw surface water. Gomati River is a semi-perennial source of water. Due to low availability of water depending entirely on surface water supply is considered unsustainable. **Combined ground and surface source – adoption of conjunctive use:** Either the groundwater or surface water is not able to fulfil the projected town demand, and therefore it is designed to utilize both the source optimally. Given less than 100% dependability of Surface water, in the low rainfall years, the deficit from the river Gomati will be met by tube wells and accordingly the water abstraction from groundwater sources will be increased as required. **Belonia** **Groundwater:** Presently source of water at Belonia town is from Muhuri River followed a water treatment plant and 4 no. Deep Tube well (DTW) are the main sources of piped water supply in the town. Presently total water abstracted from Tube Wells is approximately 0.82 MLD. **Surface Water:** At present there is a wet type of Intake well of utilized capacity 4.54 MLD (5 m dia., commissioned in 2002) located on Muhuri River and approx. 200 m away from the 4.54 MLD capacity WTP to draw surface water. Muhuri River is a semi-perennial source of water. Due to low availability of water depending entirely on surface water supply is considered unsustainable. **Combined ground and surface source – adoption of conjunctive use:** Either the groundwater or surface water is not able to fulfil the projected town demand, and therefore it is designed to utilize both the source optimally. Given less than 100% dependability of Surface water, in the low rainfall years, the deficit from the river Gomati will be met by tube wells and accordingly the water abstraction from groundwater sources will be increased as required.
Selected Alternative	**Selected source:** Combined ground and surface source- Existing intake wells and WTP + Proposed DTW and Existing DTW are selected for Udaipur, Belonia town. Only existing and new ground water source consider in Bishramganj. However, no new source considered in Amarpur and Melaghar.
3.	**Project Locations**
Description of alternatives	**Location of water intake, WTPs and Service reservoirs:** Location selection is guided by technical feasibility and system hydraulics and obviously DMA distribution. **Water Pipeline Network:** The proposed transmission and distribution network pipelines to convey water to habitations are proposed within the ROW of government owned roads.
Selected Alternative	Vacant govt. land is selected for Intake, WTPs CWRs and Service reservoirs no alternatives are considered. **Water Pipes** will be laid at most the locations along the existing rising mains and along the roads. Distribution lines will be laid from service reservoirs to the land settlement patches. Pipes will be laid at most the locations along

	the existing distribution lines and at some places along the *katcha* path and ULB roads within RoW. No land acquisition is required for laying of pipes. Water supply pipes will be laid on one or either side of the roads. There are no eco-sensitive or protected areas within the proposed project activity areas. No wildlife is also reported in the project area. During water supply pipe laying works tree cutting is not envisaged as per design.

IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

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

36. **Screening and categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories:

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

37. **Environmental Management Plan.** An environmental management plan (EMP), which addresses the potential impacts and risks identified by the environmental assessment, has been prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions are commensurate with the project's impact and risks.

38. **Environmental Audit of Existing Facilities.** ADB SPS, 2009 requires an environmental audit, if a subproject involves facilities and/or business activities that already exist or are under construction, including an on-site assessment to identify past or present concerns related to impacts on the environment. The objective of this compliance audit is to determine whether actions were in accordance with ADB's safeguard principles and requirements for borrowers/clients, and to identify and plan appropriate measures to address outstanding compliance issues.

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

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

40. **Consultation and Participation.** ADB SPS require borrower to conduct meaningful consultation[5] with affected people and other concerned stakeholders, including civil society,

[5] As per ADB SPS, 2009, meaningful consultation means a process that (i) begins early in the project preparation

and facilitate their informed participation. The consultation process and its results are to be documented and reflected in the environmental assessment report.

41. **Grievance Redress Mechanism.** ADB SPS requires borrowers to establish a mechanism to receive and facilitate resolution of affected people's concerns, complaints, and grievances about the subproject's performance. The grievance redress mechanism shall be scaled to the risks and adverse impacts of the subproject.

42. **Monitoring and Reporting.** The borrower shall monitor, measure, and document the implementation progress of the EMP. If necessary, the borrower shall identify the necessary corrective actions, and reflect them in a corrective action plan. Borrower shall prepare and submit to ADB semi-annual environmental monitoring reports (including COVID 19 compliance) that describe progress with implementation of the EMP and compliance issues and corrective actions, if any. For subprojects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis until ADB issues a project completion report.

43. **Unanticipated Environmental Impacts.** Where unanticipated environmental impacts become apparent during subproject implementation, ADB SPS requires the borrower to update the environmental assessment and EMP or prepare a new environmental assessment and EMP to assess the potential impacts, evaluate the alternatives, and outline mitigation measures and resources to address those impacts.

44. **Occupational Health and Safety.** ADB SPS requires the borrower[6] to ensure that workers[7] are provided with a safe and healthy working environment, taking into account risks inherent to the sector and specific classes of hazards in the subproject work areas, including physical, chemical, biological, and radiological hazards. Borrower shall take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work, including: (i) identifying and minimizing, so far as reasonably practicable, the causes of potential hazards to workers; (ii) providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) providing appropriate equipment to minimize risks and requiring and enforcing its use; (iv) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment; (v) documenting and reporting occupational accidents, diseases, and incidents; and (vi) having emergency prevention, preparedness, and response arrangements in place.

45. **Community Health and Safety.** ADB SPS requires the borrower to identify and assess risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the subproject, and shall establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts.

46. **Physical Cultural Resources.** The borrower is responsible for siting and designing the subproject to avoid significant damage to physical cultural resources. ADB SPS requires

stage and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues

[6] In case where responsibility is delegated to subproject contractors during construction phase, borrower shall ensure that the responsibilities on occupational health and safety are included in the contract documents

[7] Including nonemployee workers engaged by the borrower/client through contractors or other intermediaries to work on project sites or perform work directly related to the project's core functions.

that such resources likely to be affected by the subproject are identified, and qualified and experienced experts assess the subproject's potential impacts on these resources using field-based surveys as an integral part of the environmental assessment process. When the proposed location of a subproject component is in areas where physical cultural resources are expected to be found as determined during the environmental assessment process, chance finds procedures included in the EMP.

47. **ADB SPS International Best Practice Requirements.** ADB SPS, 2009 requires that, during the design, construction, and operation of the project, the executing agency shall apply pollution prevention and control technologies and practices that are consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety (EHS) Guidelines. (IFC's General EHS Guidelines[8] and Sector Specific [Water and Sanitation] Guidelines[9]). These standards contain performance levels and measures that are normally acceptable and applicable to projects. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

B. National Environmental Laws

48. **Environmental Assessment.** The Government of India EIA Notification of 2006 replacing the EIA Notification of 1994, sets out the requirement for Environmental Assessment in India. This states that Environmental Clearance is required for specified activities / projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B depending on the scale of the project and the nature of its impacts. None of the components of subproject proposed for this Package falls under the ambit of the EIA Notification 2006, and therefore EIA Study or environmental clearance is not required for the subproject.

49. **Applicable Environmental Regulations.** Besides EIA Notification 2006, there are various other acts, rules, policies, and regulations currently in force in India that deal with environmental issues that could apply to infrastructure development. The specific regulatory compliance requirements of the subproject are shown in **Table 4.**

[8]https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES

[9]https://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES

Table 4: Relevant Rules and regulations National and International

Sr. No.	Law	Description	Applicability in the project
1.	EIA Notification	The EIA Notification of 2006 set out the requirement for environmental assessment in India. Environmental Clearance is required for certain defined activities/projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence.	No project water supply components attract provisions of EIA notification 2006 and its amendment till date. Sand mining for construction works (if required), requires environment clearance under EIA act. (list of already approved sand mines in Tripura is available on TSPCB website[10]) PIU/PMU has to ensure that contractor is procuring mining material from approved mines only or get EC for new mines.
2.	Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments (1987)	Act was enacted to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, by Central and State Pollution Control Boards and for conferring on and assigning to CPCB/SPCBs powers and functions relating to water pollution control. Such projects have to obtain Consent to Establish (CTE) under Section 25 of the Act from Tripura State Pollution Control Board (TSPCB) before starting implementation and Consent to Operate (CTO) before commissioning.	No project water supply components attract provisions of Water act and not requiring CTE and CTO from TSPCB. No CTE and CTOs are required for WTPs in Tripura
3.	Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	This Act was enacted to achieve prevention, control, and abatement of air pollution activities by assigning regulatory powers to Central and State boards for all such functions. The Act also establishes ambient air quality standards.	Following will require CTE and CTO from TSPCB: Establishment of DG sets more than 1 MVA. Batching Plant, and Hot mix plants, if any If ready mix concrete and hot mix bitumen is procured from third party, contractor has to ensure that the plants, from where material is being purchased is having valid CTE & CTO and copy should be collected from third party and submitted in PIU

[10] https://tspcb.tripura.gov.in/sand-mining-ec/

Sr. No.	Law	Description	Applicability in the project
4.	Environment (Protection) Act, 1986 and CPCB Environmental Standards. (National Ambient Air Quality Standards 2009 and amendments)	Emissions and discharges from the facilities to be created or refurbished or augmented shall comply with the notified standards.	Ensure applicable standards for ambient air quality. Ensure Emission Limits standards for New DG Sets Ensure stack height standards requirement for DG Sets. Error! Reference source not found. **2** provides applicable standards for ambient air quality. Error! Not a valid result for table. provides vehicular emission norms
5.	Noise Pollution (Regulation and Control) Rules, 2000 amended up to 2010.	Rule 3 of the Act specifies ambient air quality standards in respect of noise for different areas/zones.	Ensure applicable noise standards and noise limits for DG sets. Error! Reference source not found. **3** provides applicable noise standards
6.	Central Motor Vehicle Act Central Motor Vehicle Rules and (Amendment) Rules (1988 and amendment thereafter)	Objective of this Act is to check vehicular air and noise pollution. Vehicles to be used for construction and other purposes need to meet the standards and certificates prescribed as per the Rules, 1989 to control noise, pollution, etc.	Ensure vehicle exhaust emission standards.
7.	Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010	The Act designates areas within 100 meters (m) of the "protected monument/area" as "prohibited area" and beyond that up to 200 m as "regulated area" respectively. No "construction" is permitted in the "prohibited area" and any construction activity in the "regulated area" requires prior permission of the Archaeological Survey of India (ASI).	Water supply networks are proposed within 300 m from Chaturdash Devta temple and Gunavati Group of temples in Udaipur. As per act definition of "construction" does not include **the construction and maintenance of works meant for providing supply of water for public**, of, the construction or maintenance, extension, management for supply and distribution of electricity to the public or provision for similar facilities for public. However, before start of construction ASI to be consulted for latest requirements and construction recommendations. Follow National Monument Authority Heritage bye-laws Centrally Protected Monument for Gunavati Group of Temples, and Chaturdash Devata Temple and if permission is required from ASI, it will be taken after finalization of design

Sr. No.	Law	Description	Applicability in the project
8.	The Sexual Harassment of Women at workplace (Prevention, Prohibition and Redressal) Act, 2013	Whereas sexual harassment results in violation of the fundamental rights of a woman to equality under article 14 and 15 of the Constitution of India and her right to life and to live with dignity under article 21 of the Constitution and right to practice any profession or to carry on any occupation, trade or business which includes a right to safe environment free from sexual harassment	Applicable
9.	Labor Laws upto 2019	The contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements. The contractor shall base the employment relationship upon equal opportunity and fair treatment and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment or retirement, and discipline. The contractor shall provide equal wages and benefits to men and women for work of equal value or type.	Applicable labor laws including amendments issued from time to time applicable to establishments engaged in construction of civil works. **Appendix 5** provides applicable labor laws including amendments issued from time to time applicable to establishments engaged in construction of civil works.
10.	Biodiversity Act of 2002	The Biodiversity Act 2002 primarily addresses access to genetic resources and associated knowledge by foreign individuals, institutions or companies, to ensure equitable sharing of benefits arising out of the use of these resources and knowledge to the country and the people.	Not applicable
11.	Wildlife Protection Act, 1972 amendment 1991	This overarching Act provides protection to wild animals, birds, plants, and matters connected with habitat protection, processes to declare protected areas, regulation of wildlife trade, constitution of state and national board for wildlife, zoo authority, tiger conservation authority, penalty clauses and other important regulations.	None of the components of the subproject are located within the protected Area. Therefore, this act is not applicable.
12.	The Indian Forest Act, 1927; Forest (Conservation) Act, 1980, amended 1988; Forest (Conservation) Rules, 1981 amended 1992 and 2003; and Guidelines for Diversion of Forest Lands for Non-Forest Purpose under the Forest (Conservation) Act, 1980	The Forest (Conservation) Act prevents the use of forest land for non-forest uses without the clearance from Ministry of Environment, Forests and Climate change (MoEFCC), Govt. of India For tree felling NOC will be required	Not applicable; none of the components of the subproject are located within the forest.

Sr. No.	Law	Description	Applicability in the project
13.	Wetlands (Conservation and Management) Rules, 2010 & 2017	The Rules specify activities which are harmful and prohibited in the wetlands such as industrialization, construction, dumping of untreated waste and effluents, and reclamation. The Central Government may permit any of the prohibited activities on the recommendation of Central Wetlands Regulatory Authority.	No sub project components will be planned adjacent to designated wetland No construction activity is considered within Ramsar area of Rudrasagar lake (designated protected wetland) at Melaghar town. Two distribution pipelines of about 160 m and 83 m long of 90 mm dia. is proposed in residential area for domestic connection near Rudrasagar lake. The distance of these pipeline is about 45 m to 160m from the lake within the ROW of the existing municipal roads. No impact on Ramsar protected site is expected from laying of pipe.
14.	Solid Waste Management Rules 2016	Rules to manage municipal solid waste generated; provides rules for segregation, storage, collection, processing, and disposal Responsibility of Solid Waste Generator: Segregate and store the waste generated in three separate streams namely bio- degradable, non-biodegradable and domestic hazardous wastes in suitable bins and handover segregated wastes to authorized waste pickers or waste collectors as per the direction or notification by the local authorities from time to time.	Solid waste to be generated at proposed facilities shall be managed and disposed in accordance with the MSWM Rules Contractor to follow all the rules during construction works.
15.	Construction and Demolition Waste Management Rules, 2016	Rules to manage construction and to waste resulting from construction, remodeling, repair and demolition of any civil structure. Rules define “construction waste” as waste comprising of building materials, debris resulting from construction, re-modeling, repair and demolition of any civil structure.	Construction and demolition waste generated from the project construction shall be managed and disposed as per the rules
16.	Hazardous Waste Rules 2016	The occupier of Hazardous waste shall be responsible for safe and environmentally sound management of hazardous and other wastes. As described in rules, including (a) prevention; (b) minimization; (c) reuse, (d) recycling; (e) recovery including co-processing; (f) safe and legal disposal.	Contractor to comply all the requirements of this Act during construction works.

Sr. No.	Law	Description	Applicability in the project
17.	The Child Labour (Prohibition and Regulation) Amendment Act, 2016	No child below 14 years of age will be employed or permitted to work in any of the occupations set forth in the Act's Part A of the Schedule or in any workshop wherein any of the processes set forth in Part B of the Schedule. Child can help his family or family enterprise, which is other than any hazardous occupations or processes set forth in the Schedule, after his school hours or during vacations	No children between the age of 14 to 18 years will be engaged in hazardous working conditions.
18.	Notification from Ministry of Jal Shakti (Department of Water Resources, River Development and Ganga Rejuvenation), central ground water authority on 20th September 2020. Guidelines to regulate and control groundwater extraction in the country	No Objection Certificates for ground water extraction to industries or infrastructure projects or Mining Projects etc.- All new/existing industries, industries seeking expansion, **infrastructure projects** and mining projects abstracting ground water, unless specifically exempted, will be required to seek No Objection Certificate from Central Ground Water Authority or, the concerned State/ UT Ground Water Authority as the case may be.	**Applicable for Belonia and Bishramganj** – Proposed new tube wells will require permission for groundwater withdrawal from CGWA. No new tube wells are proposed in other 3 towns.
International treaties			
19.	Ramsar Convention, 1971	The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources. India is one of the signatories to the treaty. The Ramsar convention made it mandatory for the signatory countries to include wetland conservation in their national land use plans.	Rudrasagar Lake, Ramsar protected wetland is situated in Melaghar town. A lowland sedimentation reservoir in the northeast hills, fed by three perennial streams discharging to the river Gomti. The lake is abundant in commercially important freshwater fishes like *Botia spp, Notopterus Chitala, Mystus spp., Ompok pabda, Labeo bata*, and freshwater scampi, with annual production of 26 metric-tons, and an ideal habitat for IUCN Red listed Three-striped Roof Turtle *Kachuga dhongka*. ***No construction activity considered within Ramsar protected area of Rudrasagar lake****. Two distribution pipelines of about 160 m and 83 m of 90 mm dia. is proposed in residential area for domestic connection near Rudrasagar lake. The distance of these pipeline is about 45 m to 160m from the lake within the ROW of the existing municipal roads. No impact on Ramsar protected site is expected from laying of pipe.*

Sr. No.	Law	Description	Applicability in the project
20.	Wetlands (Conservation and Management) Rules, 2017	The Rules specify activities which are harmful and prohibited in the wetlands such as industrialization, construction, dumping of untreated waste and effluents, and reclamation. The Central Government may permit any of the prohibited activities on the recommendation of Central Wetlands Regulatory Authority.	Not applicable as subprojects components are not located within any designated wetland area.
21.	Montreal Protocol 1992	India is a signatory of this convention which aims for reduction in the consumption and production of ozone-depleting substances (ODS), while recognizing differences in a nation's responsibilities. Ozone depleting substances are divided in two groups Chlorofluorocarbons (CFCs) and Hydro chlorofluorocarbons (HCFCs).	Not applicable in this project as no ODS are involved in construction works.
22.	Basel Convention on Trans-boundary Movement of Hazardous Wastes, 1989	India is a signatory of this convention which aims to reduce trans-boundary movement and creation of hazardous wastes.	Contractor to follow the provisions of Hazardous Waste Rules 2016 for storage, handling, transport and disposal of hazardous waste emerged during construction works.
23.	Convention on Migratory Species of Wild Animals (CMS), 1979 (Bonn convention)	CMS, also known as Bonn convention was adopted in 1979 and entered into force on 1 November 1983, which recognizes that states must be the protectors of migratory species that live within or pass through their national jurisdictions, and aims to conserve terrestrial, marine and avian migratory species throughout their ranges. CMS Parties strive towards strictly protecting these species, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them.	Not applicable to this project as no migratory species of wild animals are reported in the project areas.

Table 5: List of NOC Required for Safeguarding the Project

S. No	Construction Activity	Statute under which Clearance is Required	Implementation
1.	Land for project activity	Allotment and approval for specific land use	ULB
2.	Road cutting for pipe laying works	Permission from ULB and PWD (where applicable)	PIU
3.	Establishment of construction camps	Allotment and approval for specific land use	Contractor
4.	NOC for disposal of excess Earth	Construction & Demolition Waste Management Rules, 2016	Contractor
5.	Tree Cutting	State forest department/Revenue	PIU
6.	Hot mix plants, Crushers, Batching plants and DG Set	Consent to establish and consent to operate under Air Act, 1981 from TSPCB	Contractor
7.	Storage, handling and transport of hazardous materials	Hazardous Wastes (Management and Handling) Rules. 2016 Manufacturing, Storage and Import of Hazardous Chemicals	Contractor

S. No	Construction Activity	Statute under which Clearance is Required	Implementation
		Rules, 1989 from TSPCB	
8.	New Sand mining, quarries and borrow areas	Environmental clearance under EIA Notification 2006	Contractor
9.	Use of vehicles and equipment	Pollution under control certificate (PUC) form RTO	Contractor
10.	Temporary traffic diversion measures	Temporary traffic diversion measure including use of alternate road from District traffic police	Contractor
11.	Use of highway ROW for construction area/ crossing	National Highway Authority of India	PIU
12.	NOC for construction of DTW at Belonia and Bishramganj	Notification from Ministry of Jal Shakti (Department of Water Resources, River Development and Ganga Rejuvenation), central ground water authority on 20th September 2020.	Project Executing Agency - TUDA received permission from Water Resource Investigation Division, Govt. of Tripura for withdrawal of ground water. Further permission from central Ground Water Authority will be applied and taken before construction of new well after finalization of DTW location and capacity by DBO contractor
13.	NOC for intake / withdrawal of river water (Udaipur)	Withdrawal of water from Gomati River permission is obtained from Water Resource Investigation Division (WRID)	ULB

50. PMU will be overall responsible for supervision in getting all clearances and provide details to ADB through semi-annual report. PMU will ensure availability of all necessary regulatory clearances and approvals are obtained prior to commencement of works. Respective PIUs, with support of project consultants and DBO contractors, are responsible for obtaining the clearances/permits and ensuring conditions/specifications/provisions are incorporated in the subproject design, costs, and implementation. The PIUs shall report to PMU the status of compliance to clearances/permits as part of the regular progress reporting.

V. DESCRIPTION OF THE ENVIRONMENT

A. Methodology Used for Baseline Study

51. **Data Collection and Stakeholder Consultations.** Data for this report has been primarily collected through comprehensive literature survey, discussion with stakeholder agencies, and field visits to the proposed subproject sites.

52. The literature survey broadly covered the following:

(i) Project details, reports, maps, and other documents prepared by the Govt. of Tripura
(ii) Discussions with Technical experts of the PDMC team, municipal and Nagar Panchayat authorities, relevant government agencies like Tripura State Pollution Control Board (TSPCB) etc.
(iii) Secondary data from previous project reports and published articles, and
(iv) Literature on land use, soil, geology, hydrology, climate, socioeconomic

profiles, and other planning documents collected from Government agencies and websites.

B. Physical Resources

1. Location, Area, and Connectivity

53. Project towns are in western part of Tripura State, in the northeastern part of India. It is bordered to the north, west, and south by Bangladesh, to the east by Mizoram, and to the northeast Assam. It is third smallest state in India. The capital is Agartala. Baseline status of the 5 project towns is given below.

54. Table 6 shows base line characteristics of project town.

Table 6: Baseline Characteristic of project towns

Baseline Characteristic	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
Location	Udaipur town is located at 23.53°N and 91.48°E.in Gomati district on the bank of Gomati river. Udaipur is bounded by Sephaijala district on West, Khowai district on North, Dhalai district on East and South Tripura district on South.	Amarpur is located at 23.53°N and 91.64°E in Gomati district on the bank of Gomati river. Amarpur town is surrounded by Udaipur to the west, Karbook to the north, Belonia to the south, and Sabroom to the east	Bishramganj is located at 23.6128° N, 91. 4003° E in the Sepahijala district. Town is surrounded by Choumohani in south, Charilam in north, Bagma in east and Rangmala in west	Melaghar is located at 23.49°N and 91.33°E in Sipahijala district. Town is surrounded by Sonamura in north, Rudrasagar lake and Ghrantali in west, Telkajla in south and Chandigarh in east	Belonia is located at 23.25°N and 91.45°E in South Tripura District on Bank of Muhuri river. Town is surrounded by Dakshin Bharatchandranagar in north, Rudrasagar lake and Bangaladesh in west, Bashpadua in south and Uttar Sonaichhari in east
Area	Udaipur town covers an area of 6.10 sq. km and is divided into 23 wards	Amarpur town covers an area of 3.4 sq. km and is divided into 13 wards	Bishramgan ULB covers an area of 8 sq. km and is divided into 18 wards.	Melaghar town covers an area of 17.99 sq. km and is divided into 13 wards	Belonia town covers an area of 5.76 sq. km and is divided into 17 wards
Connectivity	Udaipur is about 53 Km, from the Agartala. The National Highway 8 passes through Udaipur, connecting to Agartala and Sabroom. Udaipur railway station is situated near Matabari. The nearest airport to Udaipur is Maharaja Bir Bikram Airport in Agartala, which is about 60 km away.	Amarpur is 77 km from Agartala. Amarpur is connected through National Highway 208A which Connects to Ambassa, towns are also connected to Udaipur and Teliamura. The nearest airport is the Agartala Airport, and the nearest railway station is Udaipur.	Bishramganj is about 35 km from Agartala. The ULB is connected to Mizoram by NH108, by Assam by NH27 and Manipur by NH37. NH-8 connects with Agartala, Silchar, Guwahati, The nearest airport is Agartala, which is around 41 km. The nearest railway station is at Badharghat.	Melaghar is about 50 km from Agartala. State Highway 6 connects this town to Bishalgarh, Sonamura and other towns. Nearest Railway station and Airport are in Agartala.	Belonia is linked with Agartala by NH 108A from and NH8 to Jolaibari to Agartala. The nearest airport is the Agartala Airport, and the nearest railway station is Belonia.
Topography	The town is situated on the bank Gomati River, Average elevation of Udaipur is 22 meters. The city has Highest alleviation of 60 meter & lowest elevation as 18 meters approx. Town is mostly covered by undulating hilly land, although	The town is situated on the bank of Gomati River. Amarpur town have an average elevation of 24 m above msl. Amarpur lies within low-laying alluvial plane of Gomati River & surrounded by high hilly terrane from all sides.	The Bishramganj is predominantly plain area with undulating landscape towards the outskirts of the town. The town has an average elevation of 8 m above msl (with highest elevation being 15 m above MSL). The surrounding	The town is situated near Gomati River. Melaghar is mostly covered by undulating hilly land, although there are some plain lands here and there.	Average elevation of Belonia is 23 m. The land is divided into two parts, Anticlinal Hill Ranges and Synclinal flat-bottomed valleys. The major hill ranges are Baramura and Atharamura. The Trend of the hill ranges is almost N – S. The height of the hill

Baseline Characteristic	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
	there are some plain lands here and there.		villages are hilly with dense forest.		ranges increases from west to east
Soil	Soils of Udaipur are acidic in nature. Characterized by a top soil underlain by a soft to medium/stiff, silty clay/clayey silt layer, which follows a moderately dense to very dense silty sand layer	Soils of the Amarpur area are acidic in nature., lateritic soil is found in high area, younger soils or river valley soils are found along all major river courses, clayey soils are found in paddy fields. Apart from these, sandy loam, clayey loam and loamy soils are also available	Soils of Bishramganj are Ultisols. They are sandy clay loam/ clay loam in texture. pH of the soil is neutral.	Soils of the area are taxonomically classified into four orders i.e. Alfisols, Entisols Inceptisols and Ultisols. Texture of soil is sandy loam, clayey loam, and loamy soils. Soil of Melaghar is slightly basic.	The soil in Belonia is predominantly alluvial and there are also areas with sandy soil
Seismicity	Entire north-eastern region of India extending to the Himalayan arc in the north and Burmese arc to the east is among the most seismically active regions of the world. The whole of Tripura State falls under seismic zone V and is highly vulnerable to earthquakes. Hilly areas are highly vulnerable to earthquake. Areas along the rivers are flood prone. River causes floods during the monsoon. Hilly areas are landslide prone.				
Climatic conditions	The climate in Tripura displays characteristics that are typical of the hilly and mountainous region. Tripura records a low average temperature of 10 degree Celsius in the winter season which rises to a maximum average of 35 degree Celsius in the summer. The altitude of the state also influences the climatic conditions. January is the coldest while July is the hottest. Humidity is generally high throughout the year. In the summer season the relative humidity is varied from 50 percent to 74 percent whereas in the rainy season it is over 85 percent. Rainfall varies not only from place to places. Average annual rainfall of Tripura is 2200 mm, and generally increases from southwest part of the state to northeast. The northeastern part of the state gets maximum rainfall. Rainy season generally starts by about the end of May, but thundershowers usually occur from about April to the break of the monsoon. The rainy season continues up to September. The maximum rainfall is usually recorded during the month of June – July. The months of October and November constitute the post monsoon season. Highest rainfall is recorded in between month of May & July. Project towns has almost similar climatic conditions and rainfall. The Graphs below showing rainfall in project town. There is no weather station in Bishramganj and Melaghar. Bishramganj is adjacent town to Bisalgarh and Melaghar is adjacent to Sonamura all three towns have almost same weather conditions. The **Figure 56** below shows month wise rainfall for rain gauge stations near project town. **Figure 57** shows month wise rainy days.				
Surface water	The State of Tripura is well endowed with surface water resources. As many as ten major rivers are reported to generate an annual flow of 793 million m^3 of water. All rivers are rain-fed and ephemeral in nature. All major rivers originate from hill ranges and show a typical drainage pattern called trelis, except a few instances of dendrite pattern. Rivers in the project towns are described below.				

Baseline Characteristic	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
	Gomati River. Gumti/ Gomti/Gumati or Gomati is a river flowing through the district of Comilla in Bangladesh. The river Gomati originates from the range connecting the Longtharai and Atharamura. At its source, two rivulets, namely, Kalyansing and Malyansing meet, thereafter it takes the name of Raimacherra till it meets the Sharmacherra. Later it assumes the name Gomati. The river Gomati which is about 135 km long runs across the sub-divisions Gandacherra, now under Dhalai District, Amarpur and Udaipur under Gomati District and Sonamura Sub-Division of West Tripura District. Tributaries of River Gomati are Sukheta, Choha and Andhra Choha. **Muhuri River.** Muhuri river is a transnational river between India and Bangladesh. Rising in Tripura, it flows into Bangladesh where it merges with the Feni near the latter's mouth to the Bay of Bengal. The Muhuri rises in the Lushai Hills of Tripura and flows west into Bangladesh which it enters through the Parshuram upazila of Feni district. In Bangladesh, the river separates the Feni and Chittagong districts before flowing out into the Bay of Bengal. **Figure 58** below shows the watershed map of Tripura. **Figure 59 to 63** shows waterbody maps of Udaipur, Amarpur, Bishramganj, Melaghar and Belonia. There are large water bodies in Udaipur (Amar sagar, Mahadev dighi, Jagannath dighi, and Dhani sagar), Amarpur (Amar sagar and Fatik sagar) and Rudrasagar in Melagarh. Besides, there are small water bodies /ponds (fins ponds / temple pond etc.) dot all over the towns. Rudrasagar is a large wetland to the northwest of Melagard town, and is a Ramsar wetland of international importance. **Water quality.** The Water quality data – raw and treated water from WTP shows Gomati and Mujuri River water quality parameters of TDS, DO, BOD, Total Hardness, and Lead are within permissible limits. Treated water from WTP shows higher Residual chlorine which eventually reduces while reaching consumer end. Test results presented in **Table 7 below.** There are no major pollution sources like industries in the upstream side of the existing intake. There is no such disposal point in the proximity of intake.				
Groundwater	The State of Tripura is occupied by the rocks ranging in age from Upper Tertiary to Quaternary. Mobile trough geosynclinal deposition of Barail group followed by flysch type of Surma &Tipam sediments, overlain by Dupitila formation, is noticed in the State. Most of the longitudinal synclinal valleys of the state are the basins of deposition of recent formation. Recent alluvium occurs along the streams and the flood plains of major rivers. Ground water occurs under unconfined condition in Dupitila, Recent & Tipam formations. Besides, it also occurs under confined to semi-confined conditions in Tipam formation at considerable depth. Recharge areas for the deeper aquifer lies in the adjacent anticlinal hills. Wherever a good thickness of impermeable clay beds underlie & overlie the saturated granular zones, auto flow artesian conditions have been found in the valleys, which are the discharge area. The artesian flowing conditions occur in patches both at shallow depth and at deeper depth. The auto discharge of the flowing wells in the State ranges from 100 to 6000 lph, In Rajapur – Teliamura – Udaipur area four aquifers can be identified. The first granular zone is encountered in the depth range of 25 to 56 m bgl. The thickness of the zone varies from 14 to 25 m. The second granular zone occurs between 60 – 140 m bgl. In Subroom – Manubazar area 60 – 90 m thick granular zone occur between 35 – 135 m bgl and second granular zone encountered at a depth of 150 – 195 m bgl. In the southern part of Belonia and eastern part of Manu Bhanga hill range (around Srinagar area) the sediment is more argillaceous. Ground water resources have been assessed block-wise for recharge worthy area. Total Annual Ground Water Recharge of the State has been assessed as 1.31bcm and Annual Extractable Ground Water Resource as 1.06bcm. The Annual Ground Water Extraction is 0.103 bcm and Stage				

Baseline Characteristic	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
	of Ground Water Extraction is 9.7 %. All the 59 assessment units have been categorized as 'Safe'. As compared to 2020 assessment, there is no significant change in ground water recharge and ground water extraction in the State. **Groundwater quality.** As per Ground Water Information Booklet of South Tripura District, Tripura (March 2012) Ground water contains high iron concentration. In shallow aquifer conc. of iron varies from 0.08 to 0.65 ppm and in deeper aquifer it varies from 0.5 to 3.66 ppm. Secondary Ground water monitoring data from the authentic source is not available for current year. DBO contractor will conduct the ground water monitoring prior to start of the construction work.				
Air quality	There are no data on ambient air quality of Project towns, which is not subject of monitoring by the Tripura State Pollution Control Board (TSPCB) because there are no major industries located in and around. Baseline air quality will be established at specific project locations before start of the construction, this will be included in the SEMP. Baseline monitoring will be conducted by the contractor prior to start of construction by engaging a government approved laboratory.				
Noise levels	Tripura PCB conducted noise level monitoring in the month of December 2020 is presented in **Table 8.** In Udaipur at all the zones during both day and night noise level is within the standards. In Amarpur during day time noise always above the National standard in residential and silent zones. In day time noise level exceed WHO standard at residential. During night time noise level at silent zone exceeds National standards but not WHO standards. In Belonia during day time noise always above the National standard in all zones. In day time noise level exceed WHO standard at silent and residential zones. During night-time noise level at silent and residential zone exceeds National standards and also WHO standards. Baseline noise quality will be established at specific project locations before start of the construction, this will be included in the SEMP. Baseline monitoring will be conducted by the contractor prior to start of construction by engaging a government approved laboratory.				
Ecological Resources	Tripura a small state of North-east of India having rich content of floral and faunal diversity. Total area of the state is 10,491.69 sq km in which forest area is 6294.29 sq km. Among the forest area percentage of Protected Areas (Pas) in Tripura is about 9.59%. There are 6(six) PAs throughout state which includes 4(four) Wildlife Sanctuary and 2(two) National Parks. There are no protected areas, mangroves, or estuaries in or within the subproject towns. **Figure 64 - 66** shows Forest maps of Gomati, Sepahijala district, South Tripura districts. There is no forest area nearby Udaipur, Amarpur, Bishramganj, Melagahr and Belonia town. Tree cover in all of these towns is considerable, and large tracts of land within the municipalities and surrounding areas are covered with rubber (*Havea brasiliensis*) plantations, and there are also a number of small ponds, most of which are also used by households for fishing (own consumption). Nearest forest to Udaipur is Radhakishorepur Reserve Forest located 5 km from town. Nearest forest to Amarpur is Paschim Kalajhari Reserve Forest located 10 km, nearest protected area Gumti Wildlife Sanctuary, located within 19 km from the town in south eastern extreme of Tripura. Nearest protected area to Bishramganj is Sepahijala wildlife sanctuary, located within 5.9 km from the town in Bishalgarh Development Block. Nearest Protected area to Melaghar is Rudrasagar Ramsar Site, located within the town. Nearest protected area to Belonia are Rajbari National Park and Trishna Wildlife Sanctuary, located about 7.3 km and 9.5 km respectively from the town in South Tripura & Sepahijala District **Rudrasagar Ramsar Lake-Melaghar**				

Baseline Characteristic	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
	The Rudrasagar Lake is located at 23°29' N and 90°01' E in the Melaghar block of Sonamura sub-division of Sipahijala district. The lake forms a geographical area of 2.4 km^2. Rudrasagar was identified as Ramsar site on 08.11.2005 and the status as wetland of international importance was received on 29.2.2007. Part of the town drains into this lake, and rest to Gomti river directly. The endangered Baer's Pochard and Near- Threatened Ferruginous Duck are found in this lake There are several bird species that can be found in the Rudrasagar Lake area. Some of the most common birds found in this Ramsar site include the Asian Openbill (*Anastomus oscitans*), Little Cormorant (*Microcarbo niger*), Indian Cormorant (*Phalacrocorax fuscicollis*), Grey Heron (*Ardea cinerea*), Purple Heron (Ardea purpurea), Indian Pond Heron (*Ardeola grayii*), Cattle Egret (B*ubulcus ibis*), Common Moorhen (*Gallinula chloropus*), and Pheasant-tailed Jacana (*Hydrophasianus chirurgus*). IUCN red listed local birds are White-winged Duck (EN) Swamp Grass-babbler (EN) Swamp Francolin (VU) Great Hornbill (VU) River Tern (VU) Indian Spotted Eagle (VU). About 197 Migratory birds visit Rudrasagar lake every year, IUCN Red listed migratory birds are Baer's Pochard (CR), Bengal Florican (CR),Great Knot (EN),Pallas's Fish-eagle (EN), Steppe Eagle (EN), Greater Adjutant (EN), Common Pochard (VU), Black-capped Kingfisher (VU), Greater Spotted Eagle, (VU). Migration time starts after rains and ends with winters in March. The wetland supports IUCN Red listed endangered Three-striped Roof Turtle (*Kachuga dhongka*). Aquatic plant species include rare *Lemna sps, Azolla sps, Salvania sps, Pistia sps, Otellia sps, Najas sps, Typha spp*. and. Lake supports 52 species of fishes including *Mystus cavasius (LC), Ompok bimaculatus (NT), Wallago attu (VU), Heteropneustes fossilis (LC), Puntius sophore(LC), Esomus danrica (LC), Chanda ranga(LC), Nandus nandus(LC), Anabus testudeneus (NA), Colisa fasciatus (NA), Notopterus notopterus (LC), Cirrhinus reba(LC), Labeo bata(LC), Mastacembelus pancalus (NA), Channa punctata(LC) , Macrognathus siamensis(LC), Gudusia chapra(LC), Botia rostrata (VU), Cylonia spp, Mystus aor, Mystus gulio(LC), Ompak paba (NA), Notopterus chitala (NA), Channa marulius.* 90 mm dia distribution HDEP pipelines are located about 45 m at Rajghat area and 81 m in ward no 13 from the Rudrasagar lake. The wetland boundary map is shown is **Figure 67** and details distance map of the water supply pipelines from Rudrasagar lake are given in **Figure 68- 69** and **Table 9.** Ramsar wetland in managed by Tripura Forest department according to Integrated management plan off Rudrasagar Ramsaagr Wetland **Flora.** Common floral species noted in and around forest are mentioned below. These are also common in the different parts of Gomati district, Sepahijala and South Tripura district. Nearby the project sites trees are mainly Rubber Tree *(Hevea brasiliensis*), Teak (*Tectona grandis*) and bamboo. Common species noted in and around Udaipur and Amarpur city, Teak (*Tectona grandis*), Sal (*Shorea robusta*), Gamar (*Gmelina arborea*), Chamal (*Artocarpus chaplasa*), Garjan (*Dipterocarpus turbinatus*), Koroi (*Albizia procera*), Sundi (*Michelia Montana***)** and Rubber Tree (*Hevea brasiliensis*) Common species noted in and around Bishramganj and Melaghar town, include Kanak (*Schima wallichii*), Arjun (*Terminalia arjuna*), Bahera (*Terminalia bellirica*) Various types of plant species are found in Belonia town i.e., *Rtocarpus chaplasa, Albizzia procera, Caryea arborea, Gmelina arborea, Lagerstroemia sp, Mangifera indica, Schema wallichii, Dipterocarpus Turbinatus, Termenelia belarica, Termenelia chebula, Embelica Officinalis* & *Bombax Ceiba* etc. Common Bamboo species recorded across all the subproject towns are Ba rak (*Bambusa balcooa*), Bari (*Bambusa polymorpha*), Mritinga (*Bambusa tulda*), Muli (*Melocanna baccifera*), Kai (*Bambusa nutans*), Paora (*Bambusa teres*), Rupai (*Dendrocalamus*				

Baseline Characteristic	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
	longispathus), Dolu (*Neohuzeaua dullooa*), Makal (*Bambusa pallida*), Pecha (*Dendrocalamus hamiltonii*), Kailyai (*Oxytenanthera nigrociliata*), Kanak kaich (*Bambusa offinis*), Lanthi bans (*Dendrocalamus strictus*), Tetua (*Bambusa spp*.), Ish (*Bambusa spp*.), Jai (*Bambusa spp*.), Bombash (*Bambusa spp*.), Sairil/Wadu bamboo (*Melocalamus compactiflorus*), Bosai (*bambusa spp*.). **Fauna.** The subproject locations are in and around urban areas, and lands converted long ago for urban and agricultural purposes. Therefore, existence of wild fauna is not reported. Only domestic animals such as pigs, dogs, cows, buffalos, cats, and goats are present in the subproject areas. Fauna in and around forest area are, Palm civet cat (*Paradoxurus hermaphroditus*), Jungle cat (*Felis chaus*), Barking Deer (*Muntiacus muntjak*), Common langur (*Presbytis entellus*), Rhesus Macaque (*Macaca mulata*), Phayre's leaf Monkey (*Trachypithecus phayer*), Spectacle Langur (*Tachypithecus obscures phayrei*). List of some **Fish Species** found in Gomati River is shown below. These are all LC (Least Concerned). *Amblypharyngodon mola, Macrobrachium choprai, Chanda nama, Puntius sp., Catla catla, Heteropneustes fossilis, Clarias batrachus* Similarly, in Muhuri river all fishes of least concern category is reported, some of which are. *Puntius sophore, Chitala chitala, Puntius ticto, Puntius guganio, Labeo gonius, Labeo calbasu, Labeo bata, Labeo rohita, Labeo angra, Securicula gora, Salmostama phulo, Salmostoma bacalia, Dvario devario, Amblypharyngodon mola, Osteobrama cotio, Esomus danricus, Cirrhinus reba, Cirrhinus cirrhosis, Cyprinus carpio, Catla catla, Mystus vittatus, Hemibagrus menoda, Sperata seenghala, Channa punctatus, Channa marulius, Anabas testudineus, Notopterus chitala, Macrobrachium rosenbergii, Macrobrachium lamarrei, Clarias batrachus, Oreochromis mossambicus, Tetraodon cutcutia etc.*				
IBAT screening	There are no protected areas and no key biodiversity areas within 10 km. There are 71 International Union for the Conservation of Nature (ICUN) Red List threatened species within 50 km area. **(Figure 70)** A total of 71 IUCN red list (VU,CR and EN) species reported within 50km radius. Out of these, 36 species are classified as vulnerable(VU), 9 species are classified as Critically	There are no protected areas and no key biodiversity areas within 10 km. Gomati wildlife Sanctuary is located about 11 km from project boundary. There are 69 International Union for the Conservation of Nature (ICUN) Red List threatened species within 50 km area. (**Figure 71)** A total of 69 IUCN Red List Critically Endangered (CR), Endangered (EN) and	There are no protected areas, but there is 1 key biodiversity area (KBA) Sipahhijila is within 5 km from the town and subproject components. There are 69 International Union for the Conservation of Nature (IUCN) Red List threatened species within 50 km area. **(Figure 72)** A total of 69 IUCN red list (CR, EN and VU) species reported within 50km radius. Out of these 37	Rudrasagar lake is protected and Key biodiversity area within the project area, Trishna Wildlife Sanctuary is another protect area within 10 km from the town and subproject components. There are 68 International Union for the Conservation of Nature (IUCN) Red List threatened species within 50 km area. **(Figure 73)** A total of 68 IUCN red list (VU, CR and EN) species	There is one protected areas and key biodiversity area (KBA) Trishna Wildlife Sanctuary is within 6 km from the town and subproject components. There are 141 International Union for the Conservation of Nature (IUCN) Red List threatened species within 50 km area. (**Figure 74)** A total of 141 IUCN red list (CR, EN and VU) species reported within 50km radius. Out of these, 17 species are classified as Critically

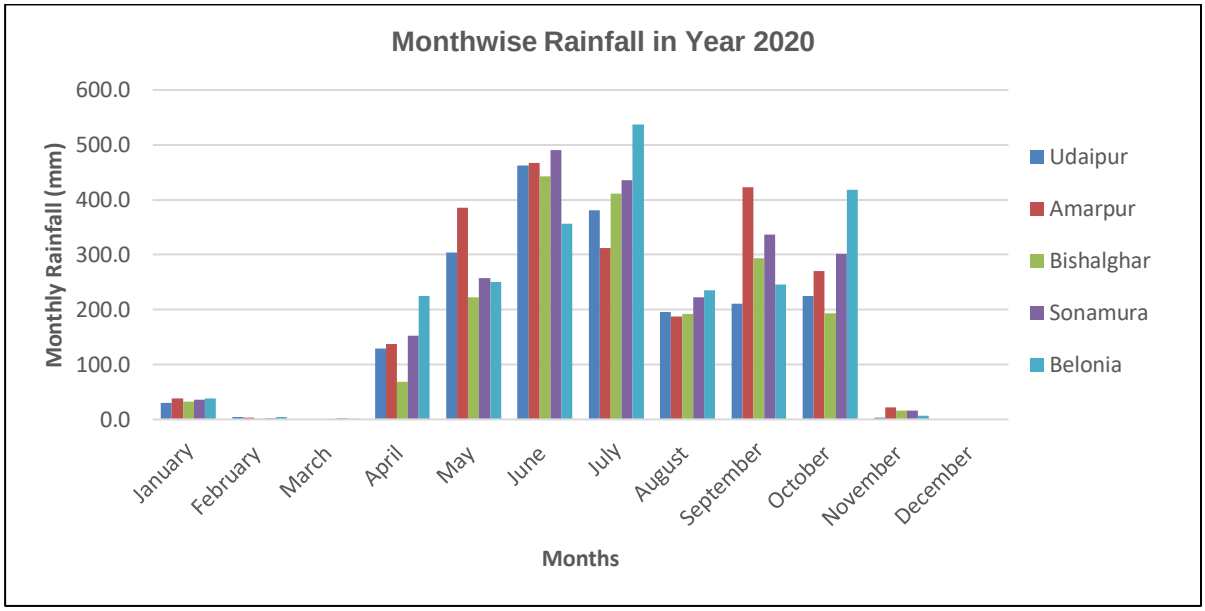
<table>
<tr><th>Baseline Characteristic</th><th>Udaipur</th><th>Amarpur</th><th>Bishramganj</th><th>Melaghar</th><th>Belonia</th></tr>
<tr><td></td><td>Endangered (CR) and 27 species are Endangered (EN). mammals are common which includes 24 species (CR-1, EN-9, VU-14), 19 birds (CR- 4, EN-6, VU-9), 17 reptiles (CR- 3, EN-8, VU-6).</td><td>Vulnerable (VU) species are reported within 50km radius. Out of these 69 IUCN Red listed species, 8 species are classified as Critically Endangered (CR) and 20 species are Endangered (EN) and 30 are Vulnerable species. Majorly Mammals are common species which include 25 species (CR-1, EN-10, and VU-14), 17 Birds (CR-4, EN-4, and VU-9), 16 Reptiles (CR- 3, EN-6, and VU-7).</td><td>species are classified as vulnerable, ,8 species are classified as Critically Endangered (CR) and 24 species are Endangered (EN). Mammals includes 23 species (EN-9, VU-14), 17 reptiles (CR- 3, EN-7, VU-7), 19 birds (CR- 4, EN-6, VU- 9).</td><td>reported within 50 km radius. Out of these 58 IUCN red list species, 8 species are classified as Critically Endangered (CR) and 21 species are Endangered (EN) along with 29 species which are vulnerable (VU). Mammals are a common species which includes 23 species (EN-9, VU-14), 17 reptiles (CR- 5, EN-6, VU-6), 18 birds (CR- 3, EN-6, VU-9).</td><td>Endangered (CR) and 53 species are Endangered (EN) and 71 vulnerable species (VU). Mammals are common species which includes 29 species (CR-1, EN-11, VU- 17), 18 reptiles (CR- 5, EN-6, VU-7), 17 birds (CR- 3, EN-4, VU-9)</td></tr>
<tr><td></td><td colspan="5">IBAT checklists of towns is attached in Appendix 14</td></tr>
<tr><td>Economic development</td><td colspan="5">Land Use
<table>
<tr><th rowspan="2">S. No</th><th rowspan="2">Land Use Category</th><th colspan="5">Percentage</th></tr>
<tr><th>Udaipur</th><th>Amarpur</th><th>Bishramganj</th><th>Melaghar</th><th>Belonia</th></tr>
<tr><td>1.</td><td>Residential</td><td>35</td><td>29.0</td><td>13.22</td><td>15.2</td><td>48</td></tr>
<tr><td>2.</td><td>Commercial</td><td>1</td><td>1</td><td>0.001</td><td>0.3</td><td>1</td></tr>
<tr><td>3.</td><td>Industrial</td><td>0</td><td>0.0</td><td>0.0</td><td>0.4</td><td>0</td></tr>
<tr><td>4.</td><td>Public and Semi-Public</td><td>3</td><td>0.04</td><td>0.001</td><td>0.9</td><td>11</td></tr>
<tr><td>5.</td><td>Mixed Use</td><td>1</td><td>0.38</td><td>4.44</td><td>49.8</td><td>0</td></tr>
<tr><td>6.</td><td>Recreational</td><td>6</td><td>0.31</td><td>0.147</td><td>11.2</td><td>1</td></tr>
<tr><td>7.</td><td>Transportation and Communication</td><td>18</td><td>0.09</td><td>2.51</td><td>2.5</td><td>21</td></tr>
<tr><td>8.</td><td>Primary Activity</td><td>10</td><td>0.27</td><td>2.00</td><td>15.6</td><td>2</td></tr>
<tr><td>9.</td><td>Protective and Undevelopable Use Zone</td><td>21</td><td>5</td><td>4.347</td><td>3.4</td><td>5</td></tr>
<tr><td>10.</td><td>Others (including agricultural, waterbody)</td><td>7</td><td>64</td><td>73.33</td><td>0.8</td><td>11</td></tr>
<tr><td></td><td>Total</td><td>100</td><td>100</td><td>100</td><td>100.</td><td>100</td></tr>
</table>
Source: GIS base Master plans of towns</td></tr>
</table>

<table>
<tr><th>Baseline Characteristic</th><th>Udaipur</th><th>Amarpur</th><th>Bishramganj</th><th>Melaghar</th><th>Belonia</th></tr>
<tr><td></td><td colspan="5">Industries. Industrial development project towns are very limited. Table 10-12 lists, industries near project towns). Town Map showing land use pattern are presented in Figure 75 -79</td></tr>
<tr><td>Demographic parameters</td><td colspan="5">
<table>
<tr><th>Parameter</th><th>Udaipur</th><th>Amarpur</th><th>Bishramganj</th><th>Melaghar</th><th>Belonia</th></tr>
<tr><td>House holds</td><td>8,530</td><td>2880</td><td>2846</td><td>2860</td><td>5363</td></tr>
<tr><td>Population</td><td>32,758</td><td>10,838</td><td>11727</td><td>12379</td><td>19996</td></tr>
<tr><td>Male</td><td>16,593</td><td>5471</td><td>5901</td><td>6398</td><td>10060</td></tr>
<tr><td>Female</td><td>16,165</td><td>5367</td><td>5826</td><td>5981</td><td>9936</td></tr>
<tr><td>Children under the age of 0-6</td><td>2836</td><td>1020</td><td>-</td><td>1346</td><td>1684</td></tr>
<tr><td>No of Wards</td><td>23</td><td>13</td><td>19</td><td>13</td><td>17</td></tr>
<tr><td>Schedule Caste (% of total Population)</td><td>19.30</td><td>27.07</td><td>25.7</td><td>27.6</td><td>27.06</td></tr>
<tr><td>Schedule Tribe (% of total Population)</td><td>1.11</td><td>3.79</td><td>1.15</td><td>1.2</td><td>3.79</td></tr>
<tr><td>Hinduism (% of total Population)</td><td>89.00%</td><td>94.82%</td><td>99%</td><td>99%</td><td>98.83%</td></tr>
<tr><td>Islam (% of total Population)</td><td>10.19%</td><td>4.02%</td><td>0.86%</td><td>0.25%,</td><td>0.27%</td></tr>
<tr><td>Others (Buddhism, Christianity, Sikhism and Jainism) (% of total Population)</td><td>Less than 1%</td><td>1.6 %</td><td>Less than 1%</td><td>Less than 1%</td><td>Less than 1%</td></tr>
<tr><td>Sex ratio (female per 100 males</td><td>974</td><td>981</td><td>988</td><td>984</td><td>988</td></tr>
<tr><td>total literacy rate</td><td>94.84 %</td><td>94%</td><td>83.96 %</td><td>90.85 %</td><td>94.99%</td></tr>
<tr><td>male literacy rate</td><td>96.50 %</td><td>95.81 %</td><td>85.71%</td><td>91.78%</td><td>97.18%</td></tr>
<tr><td>female literacy rate</td><td>93.15 %</td><td>92.54 %.</td><td>82.19 %.</td><td>83.46%.</td><td>92.77%</td></tr>
</table>
</td></tr>
<tr><td>History and tourism</td><td>Two ASI protected sites are located within Udaipur, Gunavati Group of Temples and Chaturdasa Devata Temple located within heart of the city and main market area., At few areas of the town distribution pipelines are located within 38 m from Gunavati Group of Temples and Chaturdasa</td><td>Amarpur is a picnic spot, The town stands on the ruins of a palace. On the southern bank lies a temple dedicated to the eight headed goddess, Mangalchandi. A fair is held during the Basant Panchami (February). places of interest in Amarpur are Amarsagar</td><td>No tourist spot or area of interest in Bishramgar ULB except some small temples</td><td>Rudra Sagar Ramsar site and Neermahal is the main spot of Melaghar built in the heart of Rudrasagar Lake. It was Maharaja Bir Bikram Kishore Manikya Debbarma's idea to build a palace amidst the splendid Rudra Sagar Lake and in 1921 he accredited the British</td><td>Belonia is situated adjacent to Bangladesh in the south region of Tripura. Trishna Wildlife Sanctuary under Rajnagar Block and Pilak under Jolaibari have been the major tourist attractions</td></tr>
</table>

Baseline Characteristic	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
	Devata Temple. The details distance of the major components from those protected areas are given in Figure 80-82 and **Table 13-14.** Udaipur is dotted with temples the most famous of which is the Tripura Sundari temple, which is one of the 51 Shakti Peethas. This is outside the municipal boundary, and none of the components are located nearby the temple.	& Fatiksagar lakes, Chobimura, at 8 km from Amarpur		company Martins and Burn to construct the palace for him. The company took nine years to complete the palace. Maharaja Bir Bikram Kishore Manikya Debbarma belonged to the 'Manikya Dynasty' which is supposed to be the second longest remaining dynasty in the world today.	
ASI protected Monument in Udaipur	**Chaturdash Devta temple -** Attesting a legend of Tripuresh Bhairava, the temple called Mahadev Bari was constructed by Maharaja Dhanya Manikya where the phallic emblem of Siva is installed. The deciphered stone inscriptions suggest that the bigger temple inside the premises is Gopinath temple, which faces the south. Maharaja Kalyan Manikya in 1650 C.E. (5 th Ashada, Tuesday, 1572 Saka Era) built the Gopinath temple in the premises of Mahadev Bari, dedicating it to lord Gopinath or Krishna. However, there is hearsay that it had been the temple of Chaturdasha Devata (Gopinath temple). The local people refer to the other temple within the arena as Lakshmi Narayan temple. But historical anecdotes attest that it was actually a Vishnu temple constructed by Ramdev, son of Maharaja Govinda Manikya in 1673 C.E. This part has also been attested by stone inscriptions, which suggest that the temple dates back to 1595 Saka Era (1673C.E.). (**Figure 83)** **Architectural style** - There are four structures in the same premises- to the north lies the Chaturdasha Devata temple, towards the left of which, lies the Lakshmi-Narayan temple and to the west of it has Chaturdasha Devata temple and in front of Chaturdasha Devata temple has natamandapa (dancing hall). The Mahadev Bari lies in the southernmost part of the complex. The Lakshmi-Narayana temple and the Chaturdasha Devata temple are similar on plan and architectural features. The Lakshmi-Narayana temple is smaller than the Chaturdasha Devata temple. They are built in char chala pattern and the core chamber resembles a stupa. There is an amalaka resembling a small pitcher on the top. It also features a tetrad slanting roof and a bow-shaped vault arched above the gateway. The pattern carved above the vault resembles a blooming lotus, bearing a flagstaff at the top. The temple has a pradakshinapatha (circumambulatory path). The bhogamandapa/natamandapa (dancing hall) of brick masonry is topped by chala roof lying in front of the temples to the south. A brick-built wall surrounds the ancient compound on all four sides. There is a pair of rock cut lion at the entrance of the main temple. Bricks and lime mortar have been used for construction of the temple. Amongst all these Mahadev Bari is the only living temple. Source : National Monument Authority Heritage bye-laws 2020 of Centrally Protected Monument Chaturdasha Devata Temple				

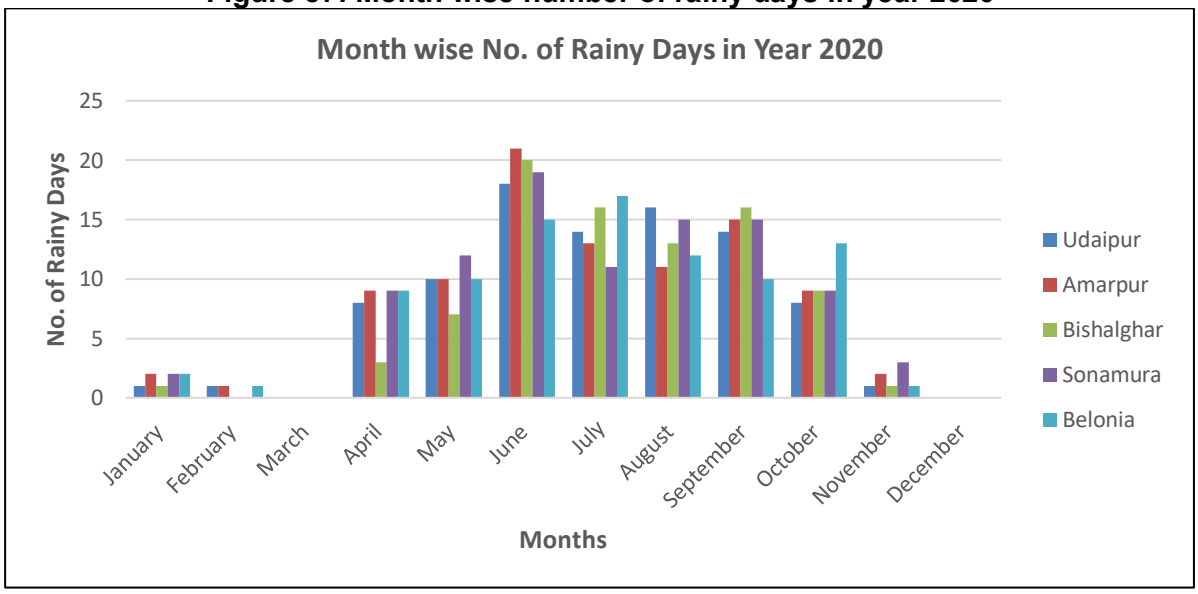
Baseline Characteristic	Udaipur	Amarpur	Bishramganj	Melaghar	Belonia
	Gunavati Group of temples: A group of three brick built temples lies adjacent to each other at the ancient capital of Tripura at Udaipur. Existence of a group of temples on the same premises is a unique characteristic of the temples of Tripura. The temple was built during the reign of Govinda Manikya (CE 1660- 1676). The northern temple bears an inscription which narrates that the temple was built by queen Gunavati, wife of Govinda Manikya, in 1668 CE. The temple was dedicated to Vishnu. The temple is square on plan and attached to an antarala (vestibule). The other two temples have no any inscription, but the architectural style of these temples indicates that both are contemporary to the temple constructed by Queen Gunavati. **(Figure 84)** **The architectural style** of the ancient Tripura temples bears the pan-Indian traits assimilated in a new style of terracotta chala temples with votive stupa like finials. These temples architecture are almost like other contemporary temples of Tripura except that these have their vestibule devoid of hemispherical and on the roof. The temples are covered by chala roof with finial resembling votive stupa/hemispherical anda. There are tapering buttresses which arc attached to the corners of the temple. The temple's walls on all sides are decorated with linear segments. The western most temple is the smallest in size among them. Source : National Monument Authority Heritage bye-laws 2021 of Centrally Protected Monument Gunavati Group of Temples, Radhakishorepur, Gomati.)				

Figure 56*:* Month wise rainfall data in Year 2020



(Source: https://www.agri.tripura.gov.in/sites/default/files/Station_wise.pdf)

Figure 57*:* Month wise number of rainy days in year 2020



(Source: https://www.agri.tripura.gov.in/sites/default/files/Station_wise.pdf)

Figure 58: Watershed Map of Tripura watershed showing important rivers and Bangladesh International Boarder

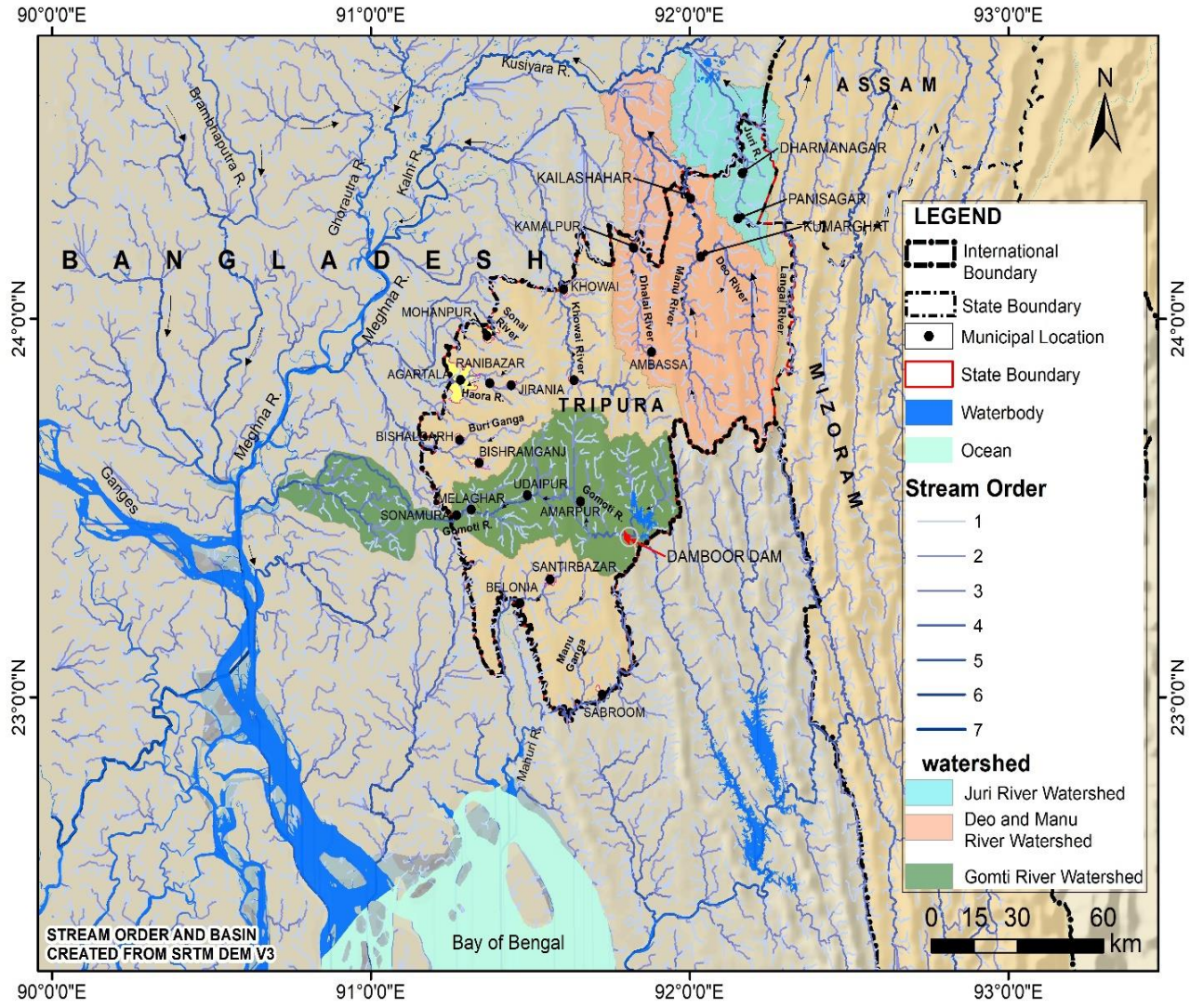


Figure 59: Waterbody Map of Udaipur

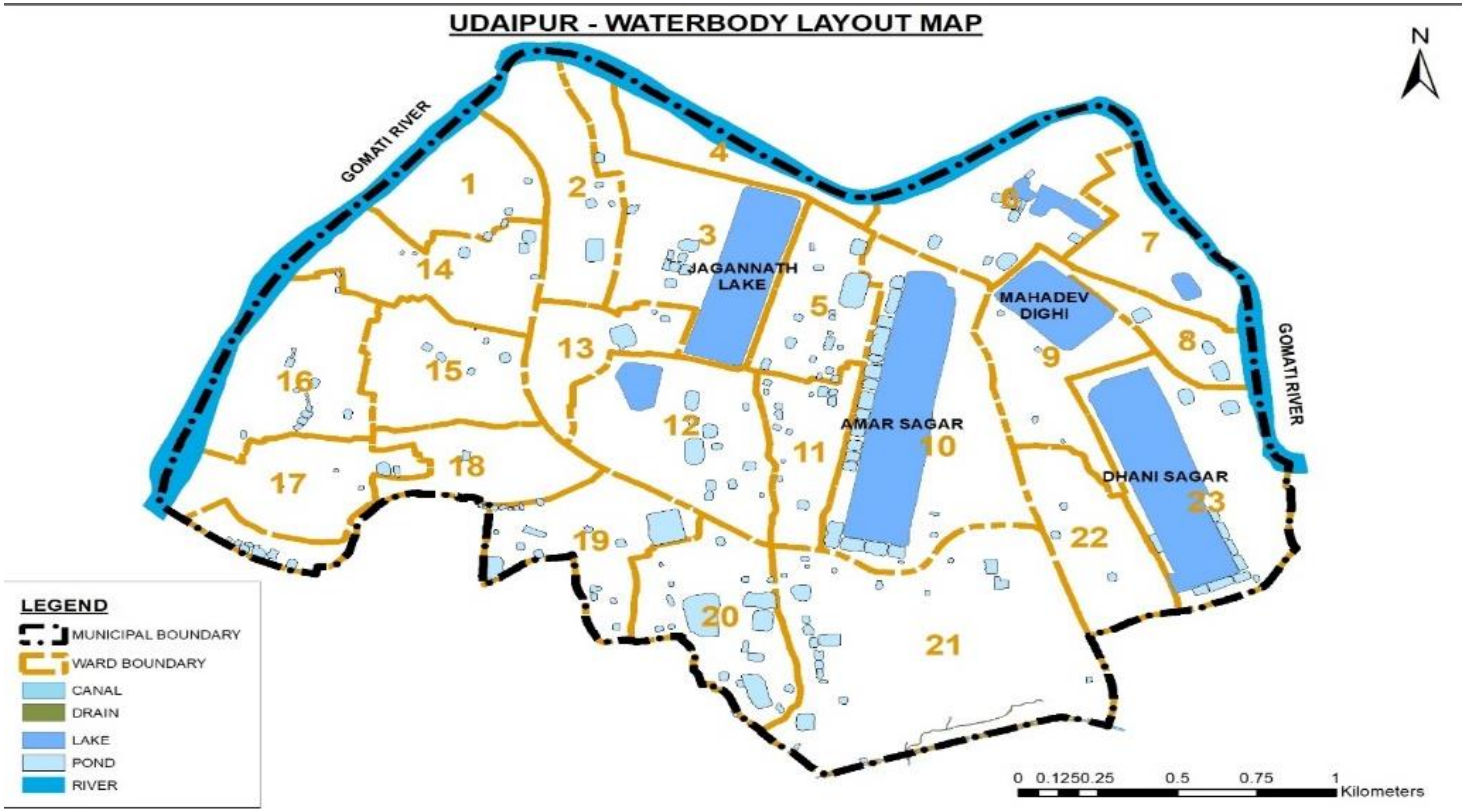


Figure 60: Waterbody Map of Amarpur

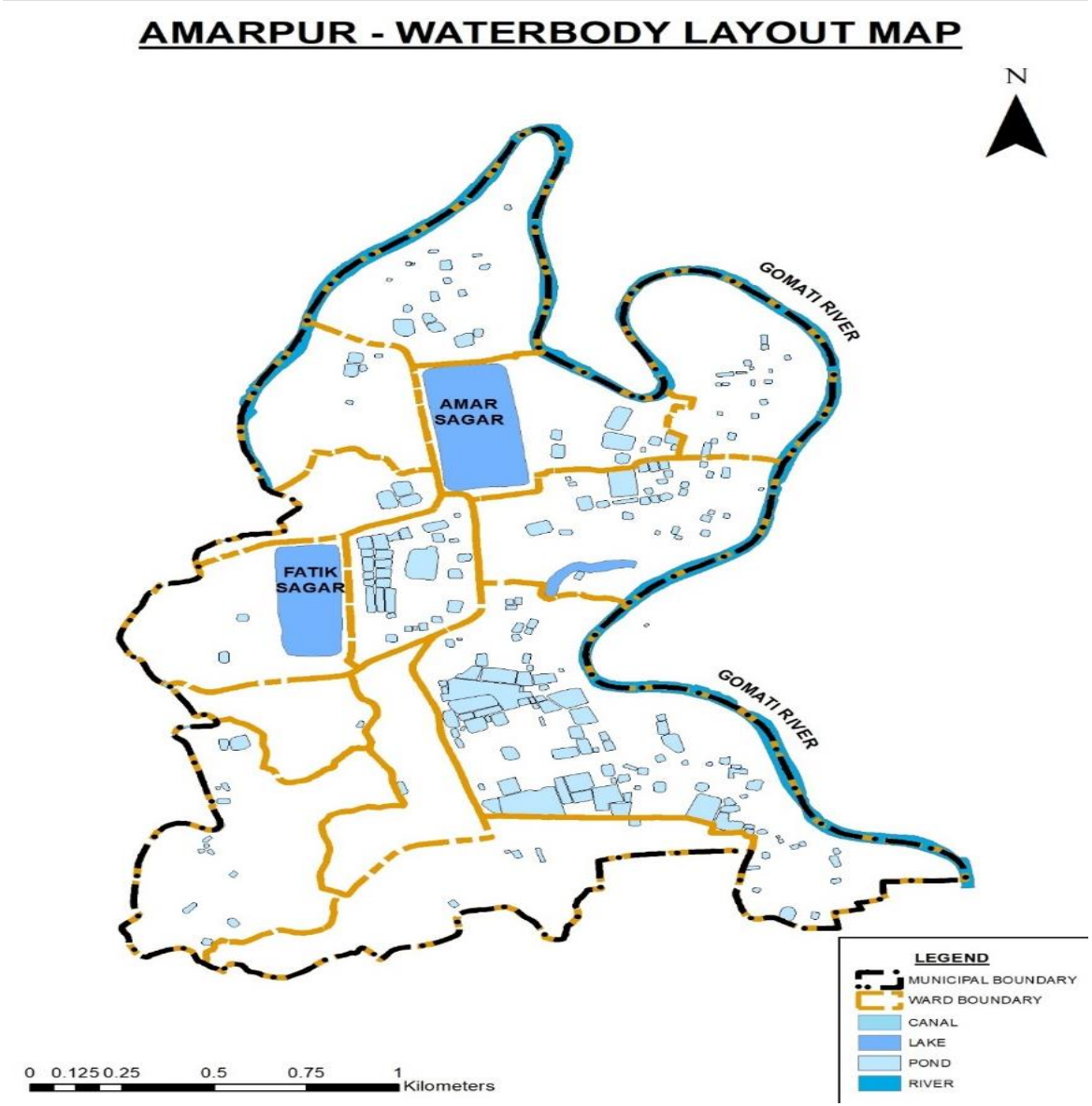


Figure 61: Waterbody Map of Bishramganj

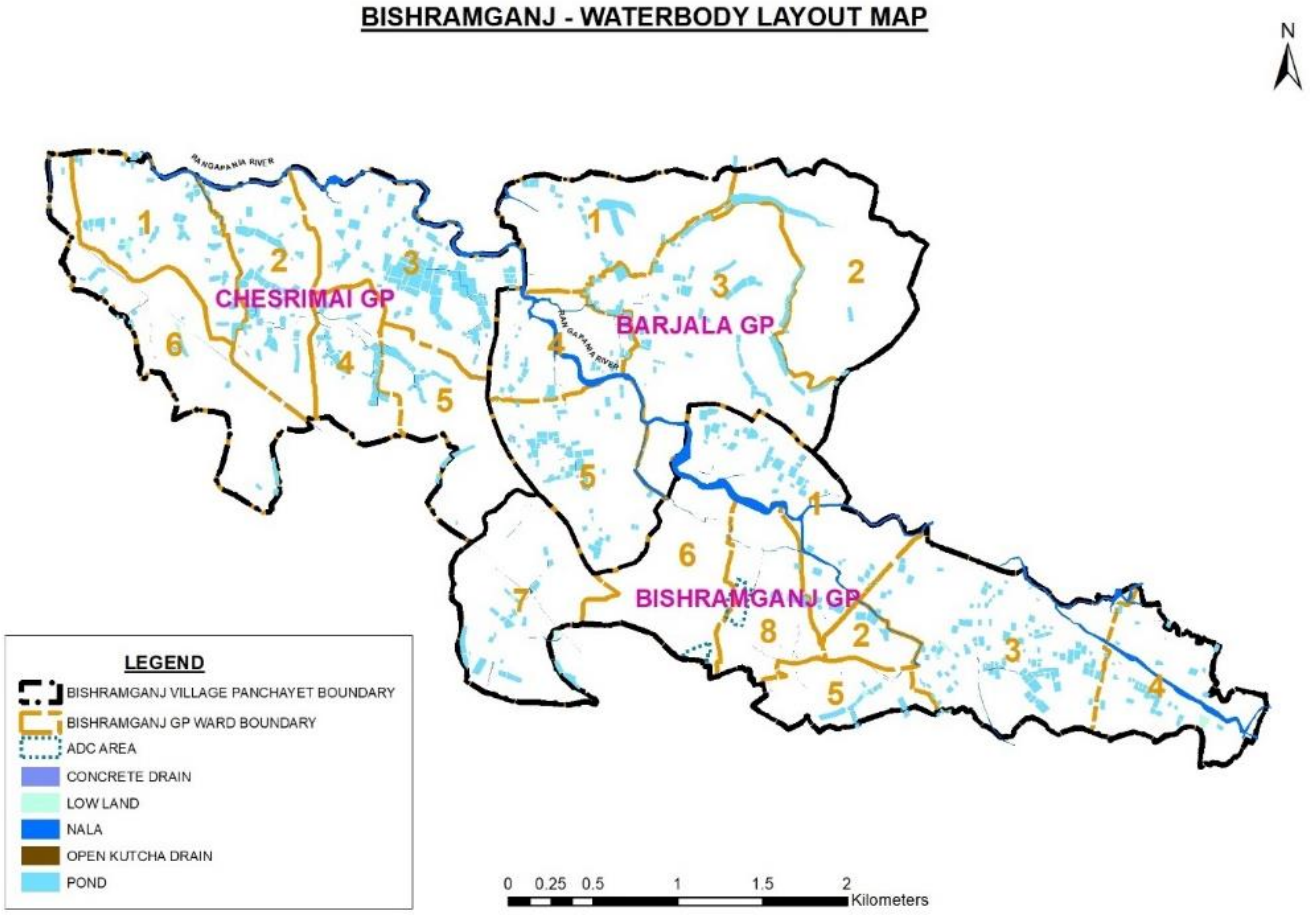


Figure 62: Waterbody Map of Melaghar

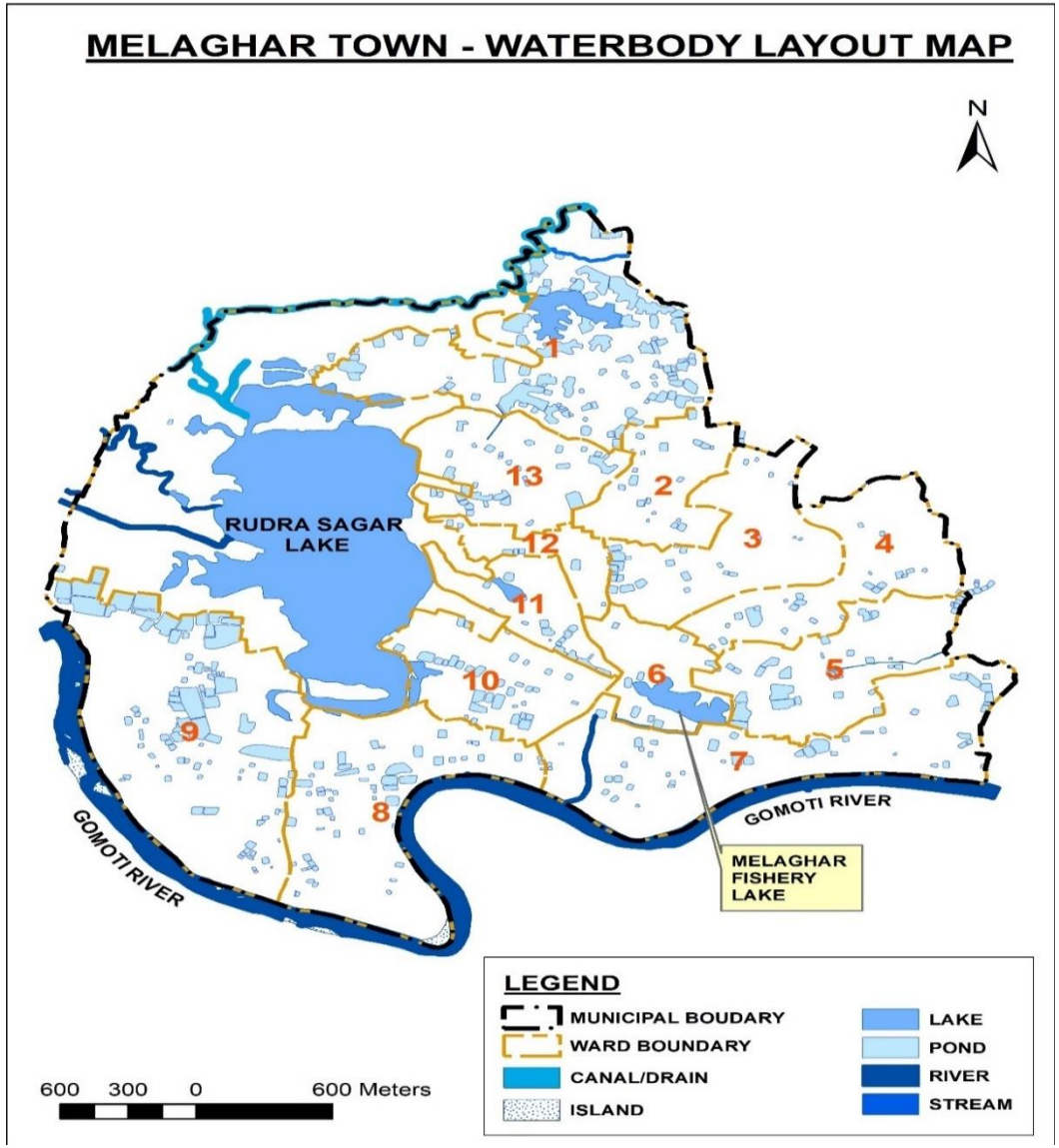


Figure 63: Water body layout map of Belonia

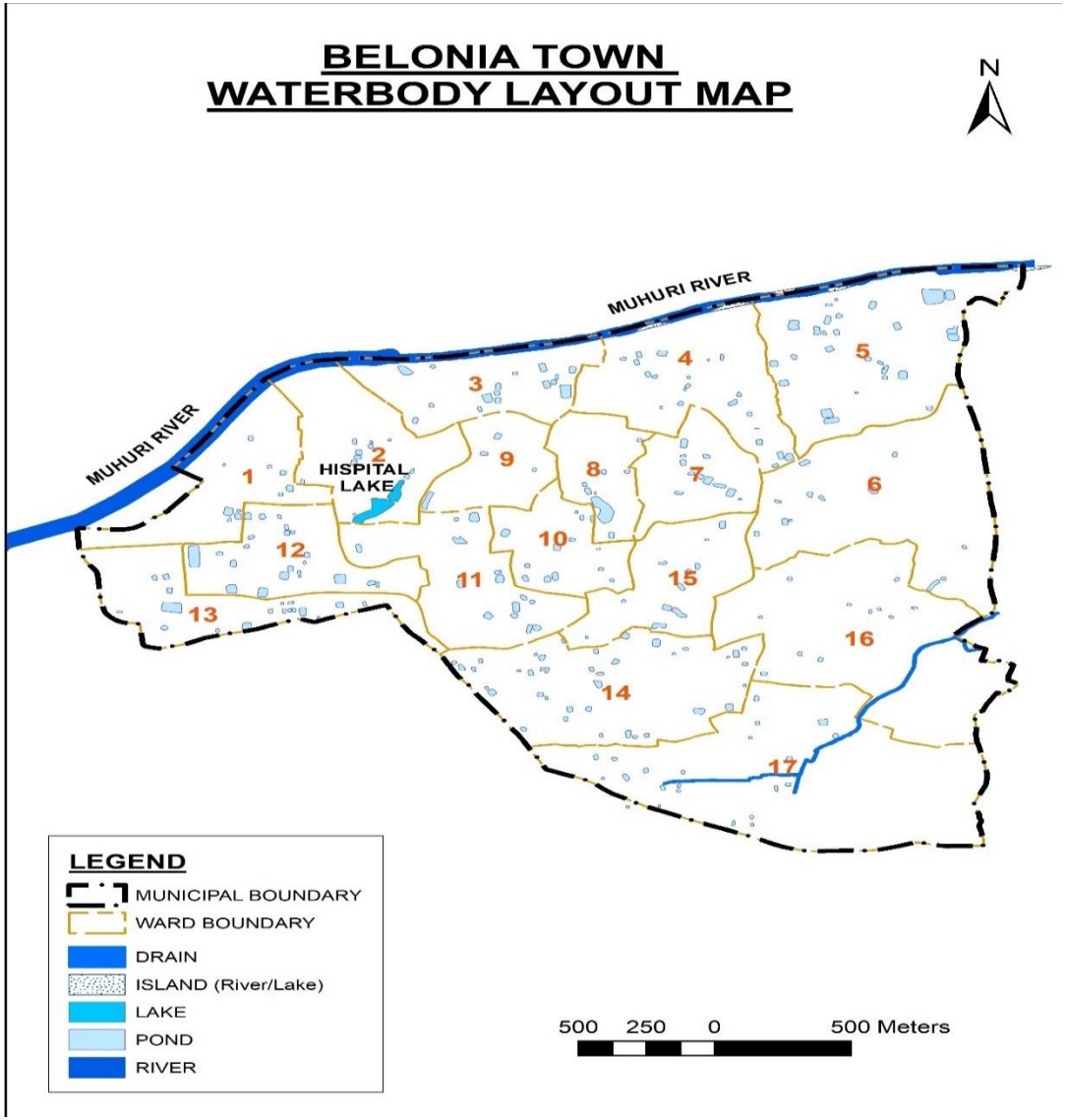


Table 7: Analytical results of Water Quality Data of Raw and WTP treated Water from project town Rivers

Date	Turbidity (NTU)		pH		Hardness (mg/l)		Total Iron (mg/l)		R. Cl (mg/l)		TDS (mg/l)		Alkalinity (mg/l)	
	Raw	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**
Udaipur Raw and treated water from Gomati River at WTP														
31/01/2023	83.3	0.82	7.1	7.0	48.6	54	1.22	0.22	-					
01/02/2023	83	0.67	7.05	7.1	48	53	1.23	0.21	-					
02/02/2023	84	0.77	7.05	7.1	49.5	54	1.24	0.21	-					
03/02/2023	84.4	0.83	7.1	7.0	48.4	54	1.29	0.21	-					
04/02/2023	25	0.84	7.1	7.0	49	56	1.22	0.21	-					
Average	**71.94**	**0.786**	**7.08**	**7.04**	**48.7**	**54.2**	**1.24**	**0.212**	-					
Amarpur Raw and treated water from Gomati River at WTP														
20/03/2023	42	0.4	7.2	7.1	64	70	0.6	0.1	-	0.2	52	52	60	72
21/03/2023	42	0.3	7.4	7.1	66	74	0.6	0.1	-	**0.3**	52	50	64	70
22/03/2023	40	0.4	7.3	7.1	68	72	0.5	0.1	-	**0.4**	58	52	66	70
23/03/2023	44	0.4	7.2	7.1	66	70	0.5	0.1	-	**0.4**	56	52	68	70
24/03/2023	46	0.4	7.4	7.1	70	76	0.5	0.1	-	**0.3**	49	50	64	70
Average	**42.8**	**0.38**	**7.3**	**7.1**	**66.8**	**72.4**	**0.54**	**0.1**	-	**0.32**	**53.4**	**51.2**	**64.4**	**70.4**
Melaghar - Raw and treated water from Gomati River at WTP														
13/03/2023	32	0.84	7.01	7.20	38	40	-	-	-	**0.4**				
14/03/2023	31	0.78	7.01	7.21	38	39	-	-	-	**0.4**				
15/03/2023	34	0.82	7.00	7.20	40	40	-	-	-	**0.4**				
16/03/2023	30	0.87	7.00	7.21	39	41	-	-	-	**0.4**				
17/03/2023	25	0.93	7.00	7.20	40	39	-	-	-	**0.4**				
Average	**30.4**	**0.848**	**7.004**	**7.204**	**39**	**39.8**			-	**0.4**				
Belonia - Raw and treated water from Muhuri river at WTP														
20/03/2023	47	0.79	6.89	7.13	50	46	0.676	0.276	-	**0.5**			88	80
21/03/2023	45	0.85	6.90	7.17	56	48	0.648	0.273	-	**0.5**			90	74
22/03/2023	43	0.45	6.89	7.09	58	44	0.675	0.281	-	**0.5**			90	76
23/03/2023	40	0.62	6.90	7.05	56	46	0.671	0.256	-	**0.5**			88	78
24/03/2023	40	0.81	6.89	7.09	50	44	0.694	0.247	-	**0.5**			86	80
Average	**43**	**0.70**	**6.89**	**7.11**	**54**	**45.6**	**0.673**	**0.267**	-	**0.5**			**88.4**	**77.6**

Date	Turbidity (NTU)		pH		Hardness (mg/l)		Total Iron (mg/l)		R. Cl (mg/l)		TDS (mg/l)		Alkalinity (mg/l)	
	Raw	Clear	Raw	Clear	Raw	Clear	Raw	Clear	Raw	Clear	Raw	Clear	Raw	Clear
National Standards for Drinking Water [a]		**1 (5[c])**		**6.5 – 8.5**		**200 (600[c])**		**0.3**		**0.2**		**500 (2000)**		
WHO Guidelines for Drinking-Water Quality, 4th Edition, 2011[b]										**5**				

Source: DWS of respective towns, DWS, Water Treatment Plant laboratory; [a] Bureau of India Standard 10500: 2012.; [b] Health-based guideline values. ;[c] Figures in parenthesis are maximum limits allowed in the absence of alternate source.

Table 8: Noise level data of Project towns during December, 2020

Type of area	Location	Day time Measured value in dB			Day Time Standards		Nighttime Measured value in dB			Nighttime Standards		Activities around monitoring locations
		Lmin	Lmax	Leq	Indian	WHO Guidelines	Lmin	Lmax	Leq	Indian.	WHO Guidelines	
Udaipur												
Industrial	Dhajanagar Industrial Estate	57.36	64.32	61.44	75	70	43.28	46.64	45.02	55	70	-
Commercial	Bhramhabari	60.98	67.22	64.27	65	70	43.34	46.4	45.01	55	70	-
Residential	West Bank of Amarsagar	52.46	56.8	54.71	55	55	41.56	45.42	43.35	45	45	-
Silent	Udaipur Sub-Divisional Hospital	46.82	52.16	49.92	50	55	39.32	42.12	40.75	40	40	Public noise
Amarpur												
Commercial	Amarpur Bazar	55.46	60.58	58.63	65	70	41.98	45.7	43.96	55	55	
Residential	Birganj	53.4	56.46	**55.01***	55	55	40.08	45.24	43.12	45	45	Public movement.
Silent	Amarpur Sub-Divisional Hospital	51.44	55.64	**53.91***	50	55	39.86	42.86	**41.48***	40	45	Public movement.
Bishalgarh Sub-Division												
Commercial	Bishalgarh (Uttar Bazar)	65.16	68.98	**68.80***	65	70	40.46	53.22	52.18	55	70	Heavy Vehicular movement
	Bishalgarh Boxonagar Road	45.5	51.78	48.77	65	70	40.88	43.34	42.25	55	70	-
Residential	Bishalgarh, Takerjala Road	65.64	68.58	**68.22***	55	55	52.08	54.76	**53.98***	45	45	Human gathering

Type of area	Location	Day time Measured value in dB			Day Time Standards		Nighttime Measured value in dB			Nighttime Standards		Activities around monitoring locations
		Lmin	Lmax	Leq	Indian	WHO Guidelines	Lmin	Lmax	Leq	Indian.	WHO Guidelines	
Silent	Bishalgarh Hospital	58.1	59.88	**60.17***	50	55	46.92	50.68	**49.25***	40	45	Vehicular movement public crowd.
Sonamura Sub-Division												
Commercial	Sonamura Bazar	52.5	57.2	55.04	65	70	40.5	42.12	41.56	55	55	-
	Sonamura Ramthakur Sevamandr	53.12	57.18	56.60	65	70	39.86	41.5	40.80	55	55	-
	Sanghati Bridge	70.1	72.66	**71.81***	65	70	59.06	63.0	**62.51***	55	55	-
Residential	Sonamura Hospital	44.8	47.96	47.24	55	55	36.4	39.4	38.12	45	45	-
	Sonamura Bazar	52.5	57.2	**55.04***	55	55	40.5	42.12	41.56	45	45	-
Silent	Sonamura Ramthakur Sevamandr	53.12	57.18	**58.60***	50	55	39.86	41.5	40.80	40	45	-
Belonia												
Commercial	Ek No. Tilla Market	60.72	67.74	64.43	**65**	70	41.12	43.48	42.38	55	55	
Residential	Arjya Colony	52.48	57.56	**55.15***	**55**	55	40.34	42.54	41.47	45	45	Public crowd
Silent	Belonia Sub-Divisional Hospital	54.18	59.32	**57.15***	**50**	55	39.94	41.9	**40.99***	40	45	Vehicular movement, Public crowd.

Source: Annual report TSPCB

Figure 64: Forest Map of Gomati District

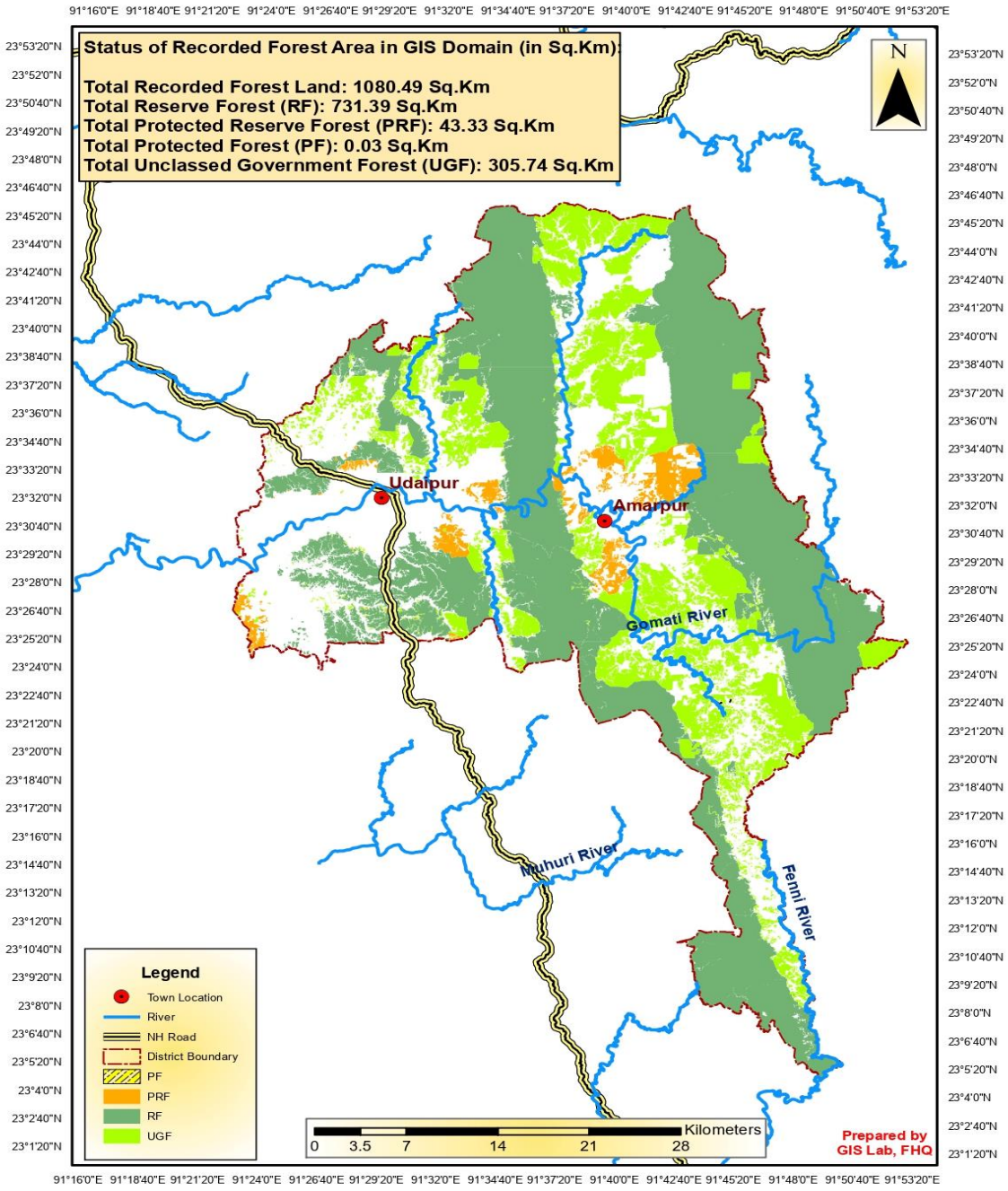


Figure 65: Forest map of Sepahijala district

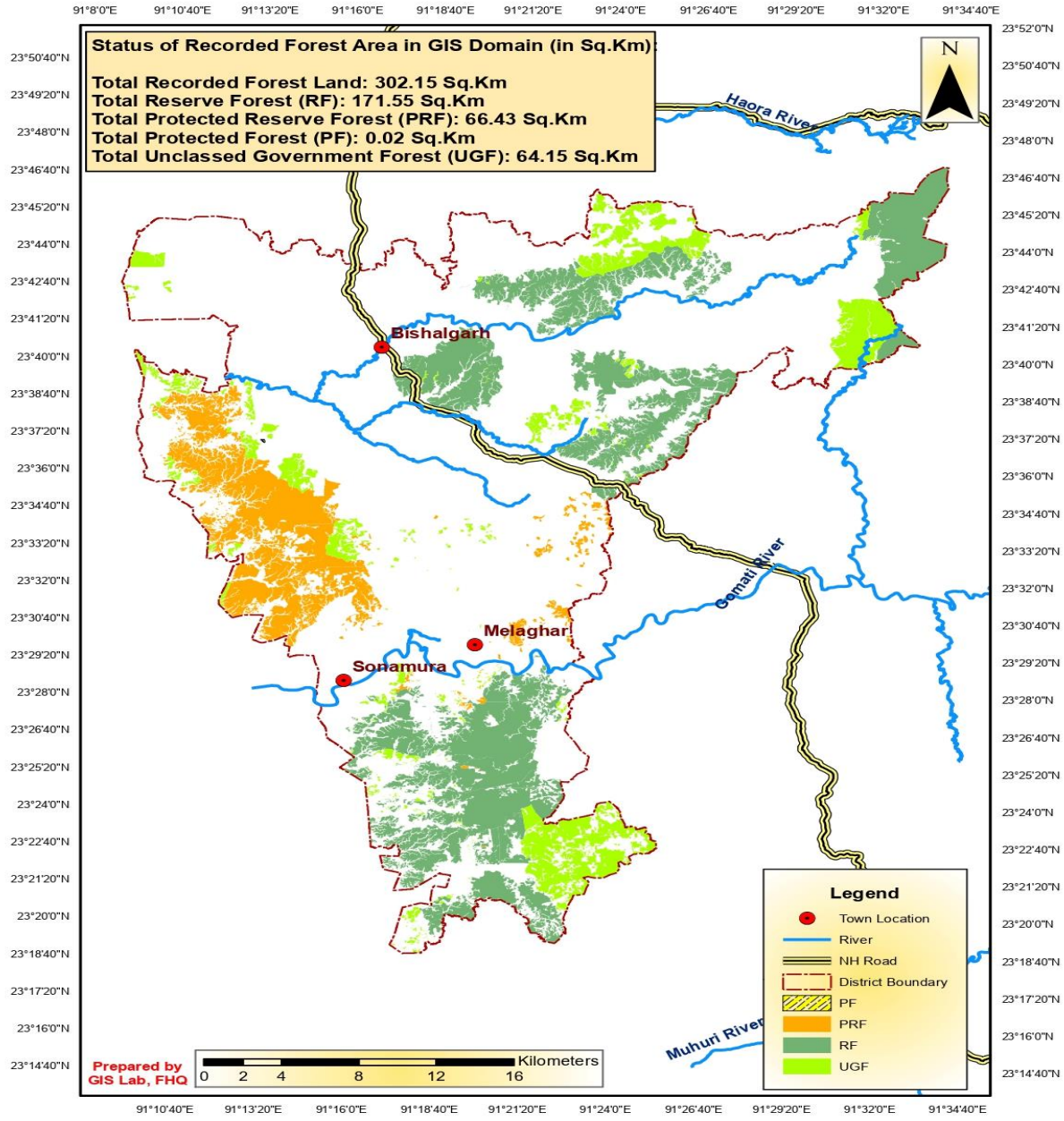


Figure 66: Forest map of South Tripura district

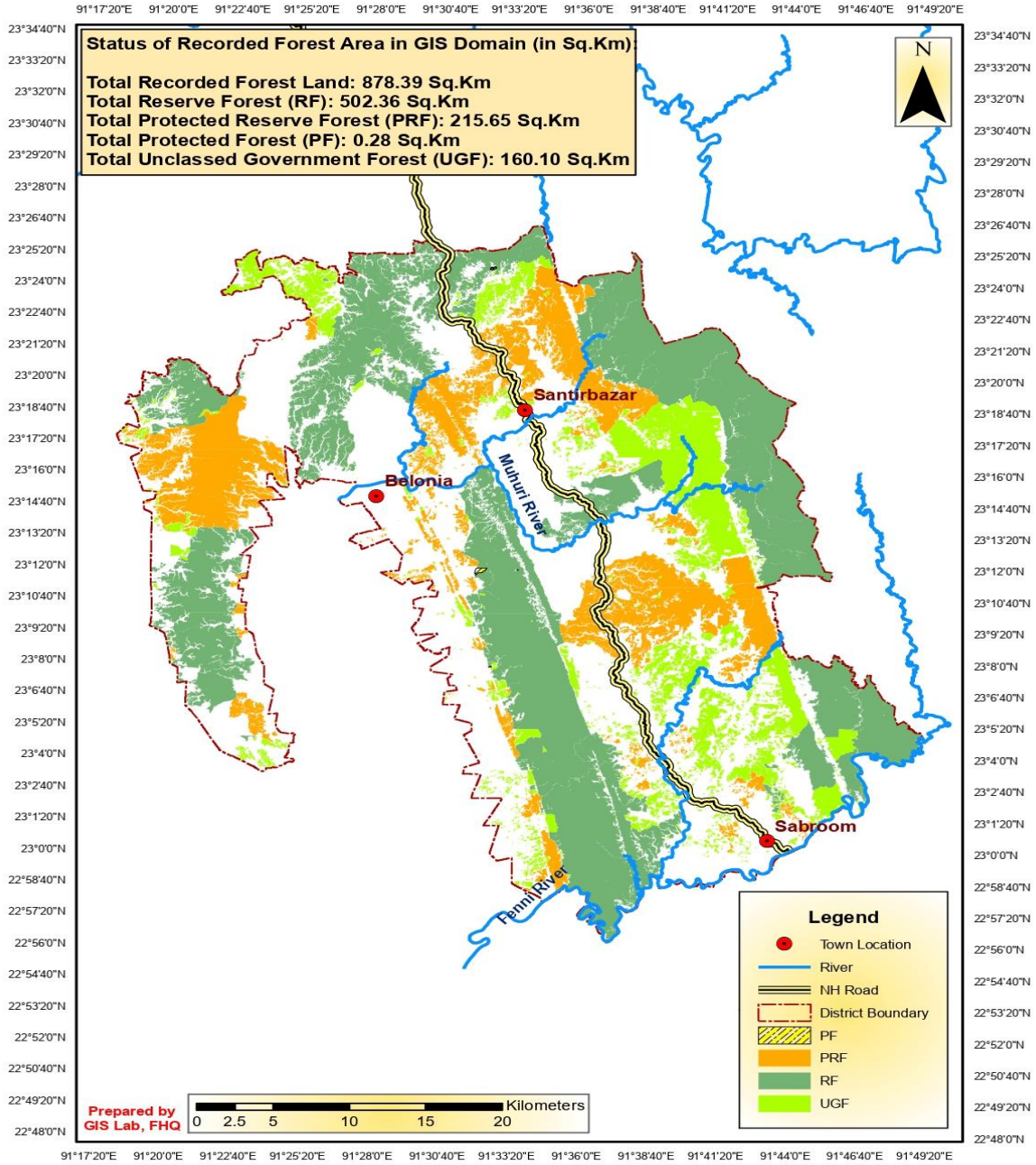
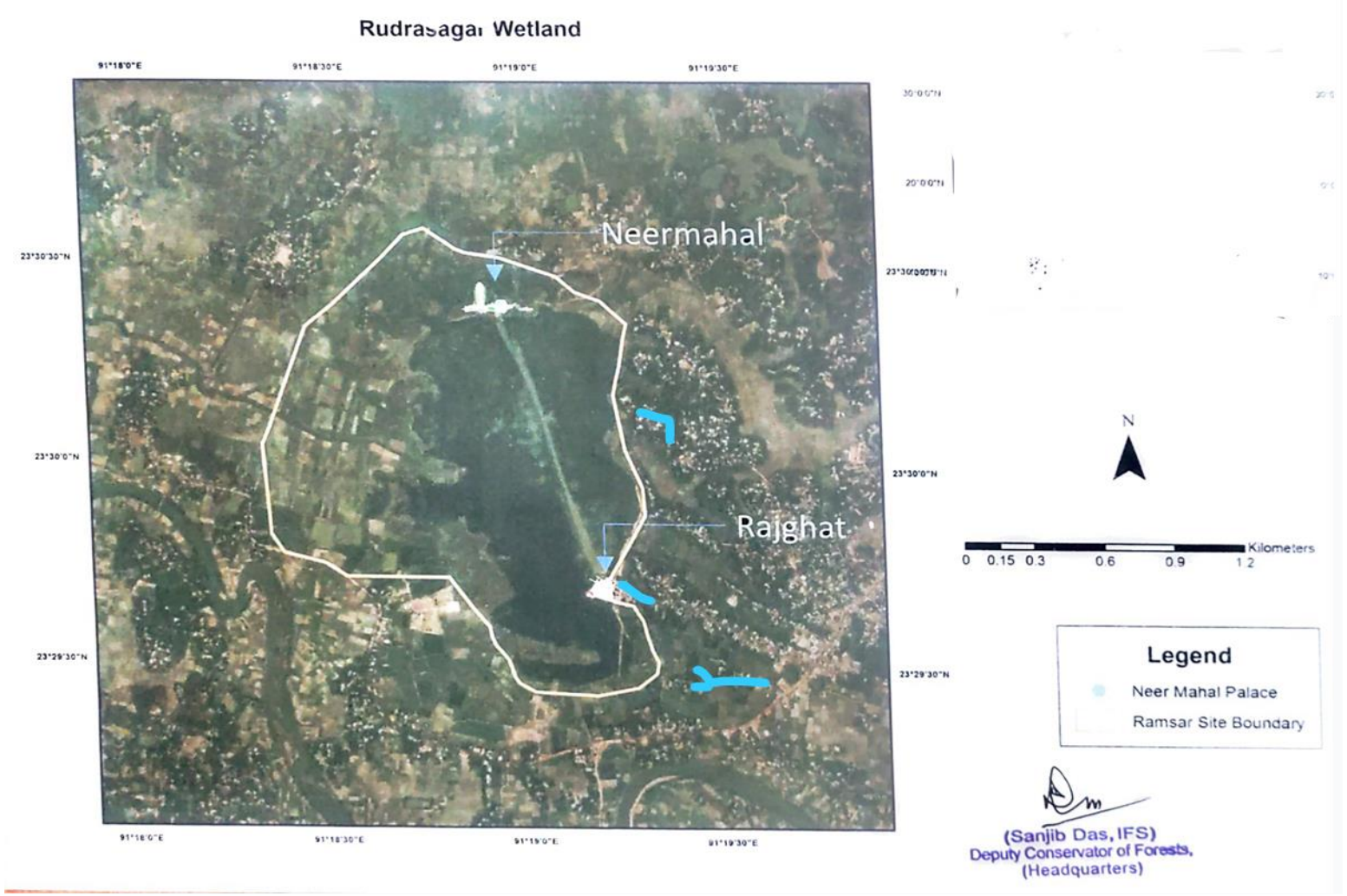


Table 9: Details of network proposed near Rudrasagar Lake-Melaghar

Sl. no	Proposed Components	Ward Number	Distance (aerial distance) from the Rudrasagar Lake
1	Proposed OHT	Ward No. 01	1.08 KM
2	Proposed CWTM	Ward No. 02	1.12 Km
3	Proposed Distribution line of 90 mm HDPE	Ward No. 13	81 M
4	Proposed Distribution line of 90 mm HDPE (Near Rudra House)	Ward No. 10	46 M
5	Proposed Distribution line of 125 mm HDPE	Ward No. 11	513 M
6	Proposed Distribution line of 140 mm HDPE	Ward No. 11	543 M

Figure 67: Rudrasagar wetland boundary along with nearby water supply pipelines, Source: Tripura Forest Department



Rudrasagar wetland in Melaghar

Figure 68: 90 mm distribution proposed pipeline (Blue, existing pipeline -Red) for domestic connection in ward 13 (ward boundary – yellow) at distance of 81 m from Rudrasagar lake

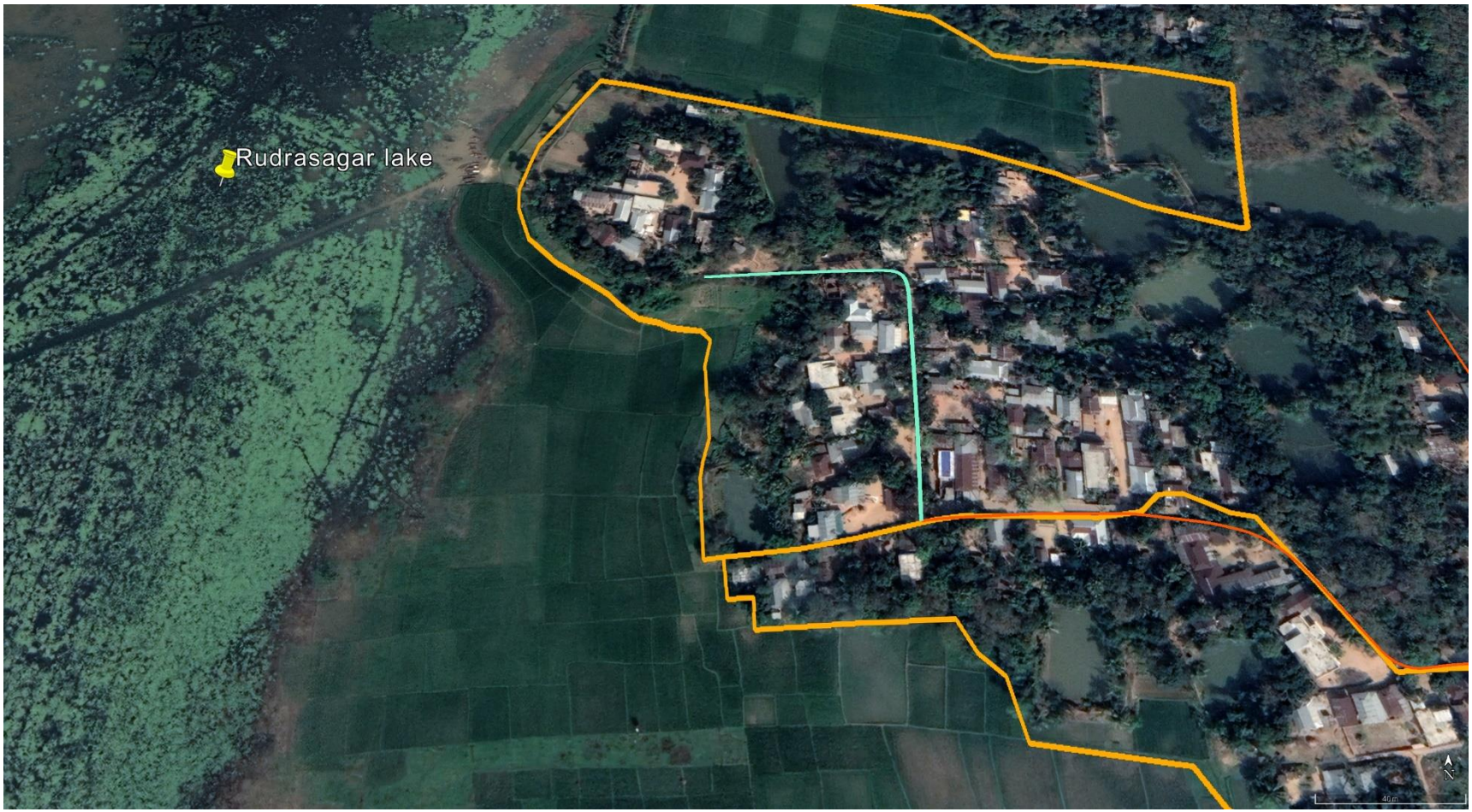


Figure 69:90 mm distribution proposed pipeline (Blue, existing pipeline -Red) for domestic connection in ward 10 (ward boundary – Yellow at distance of 46 m from Rudrasagar lake

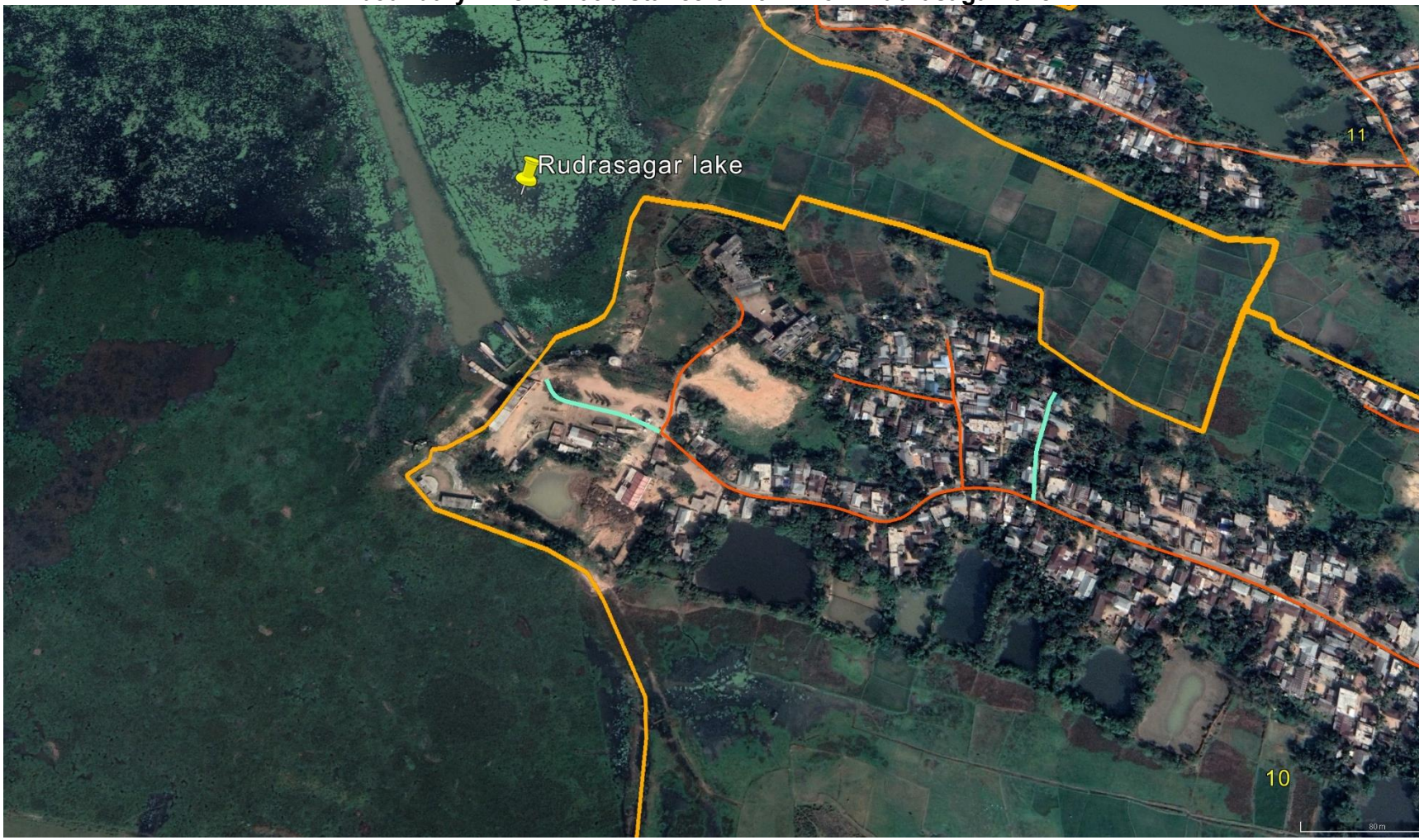


Figure 70: Key biodiversity areas and Protected Areas in proximity to proposed components in Udaipur town

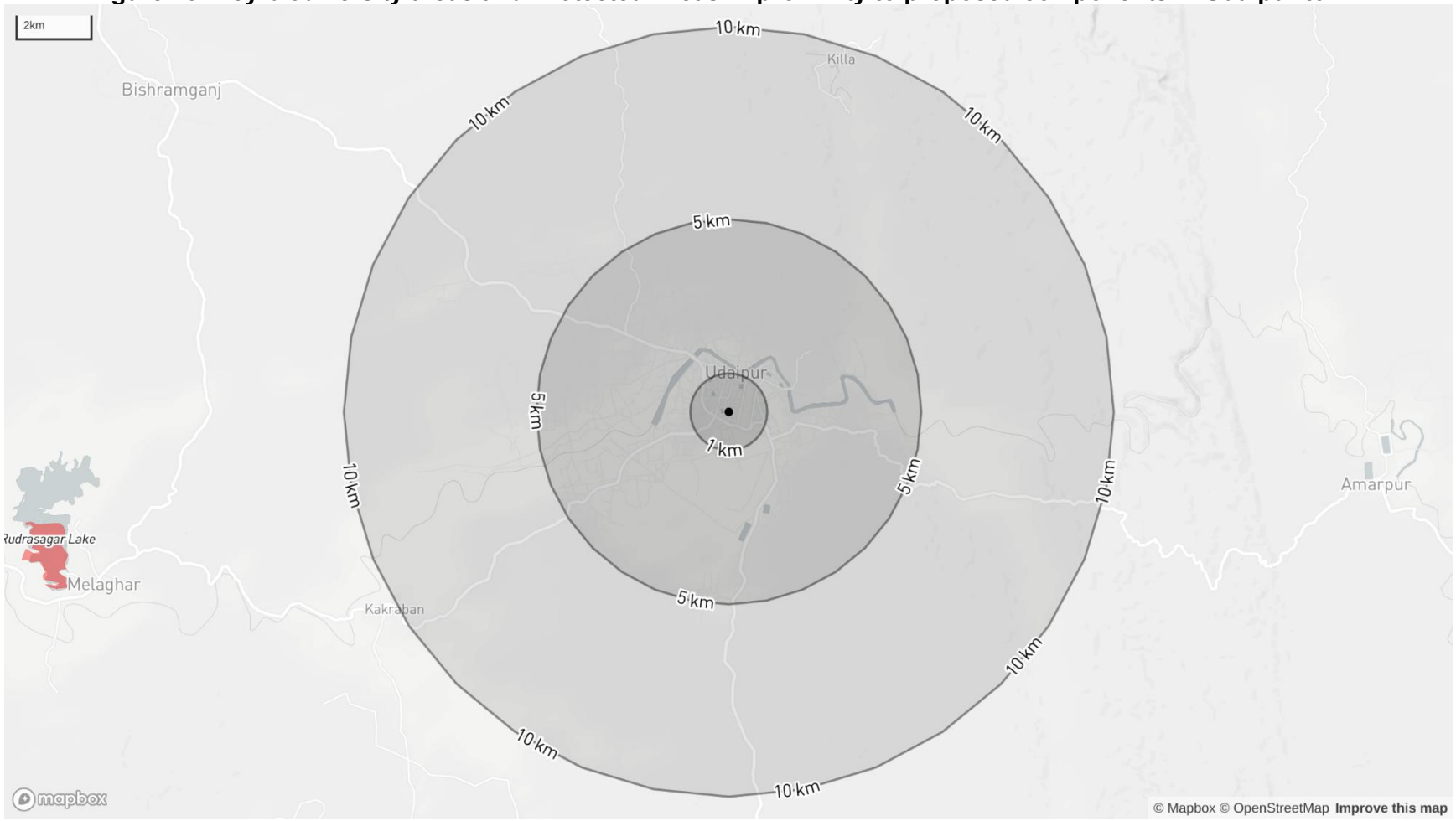


Figure 71: Key biodiversity areas and Protected Areas in proximity to proposed components in Amarpur town

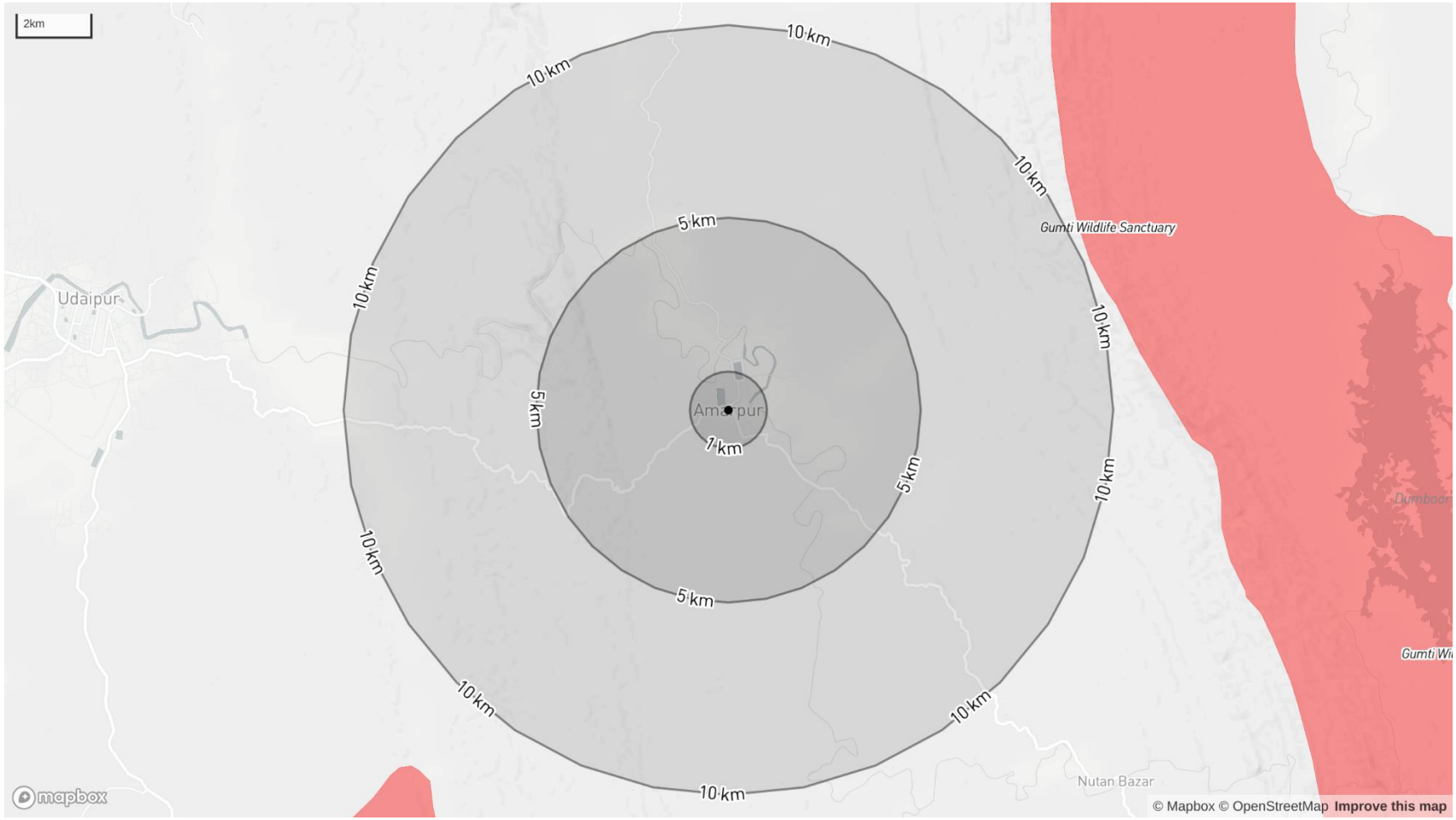


Figure 72: Key biodiversity areas and Protected Areas in proximity to proposed components in Bishramganj town

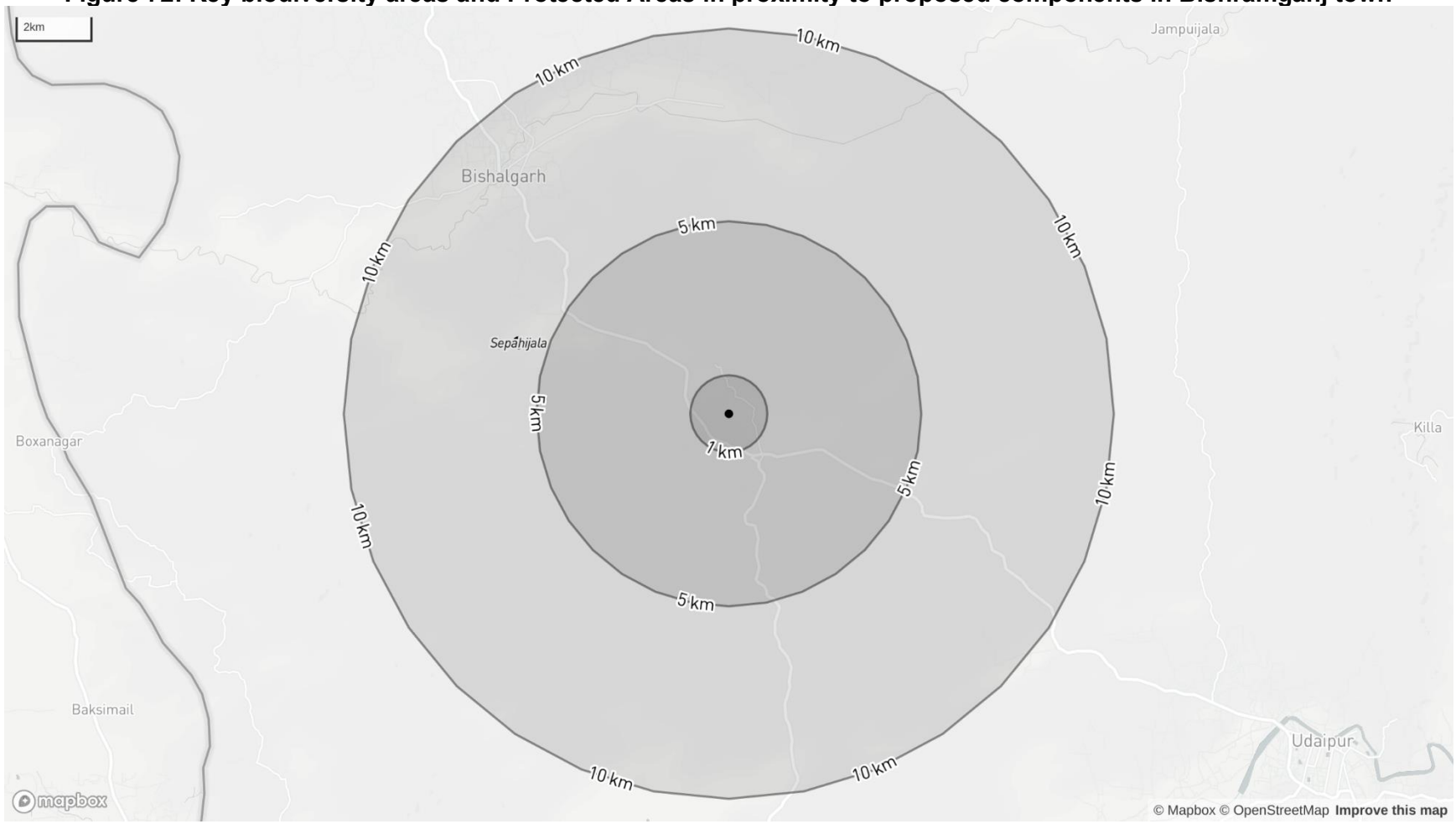


Figure 73: Key biodiversity areas and Protected Areas in proximity to proposed components in Melaghar town

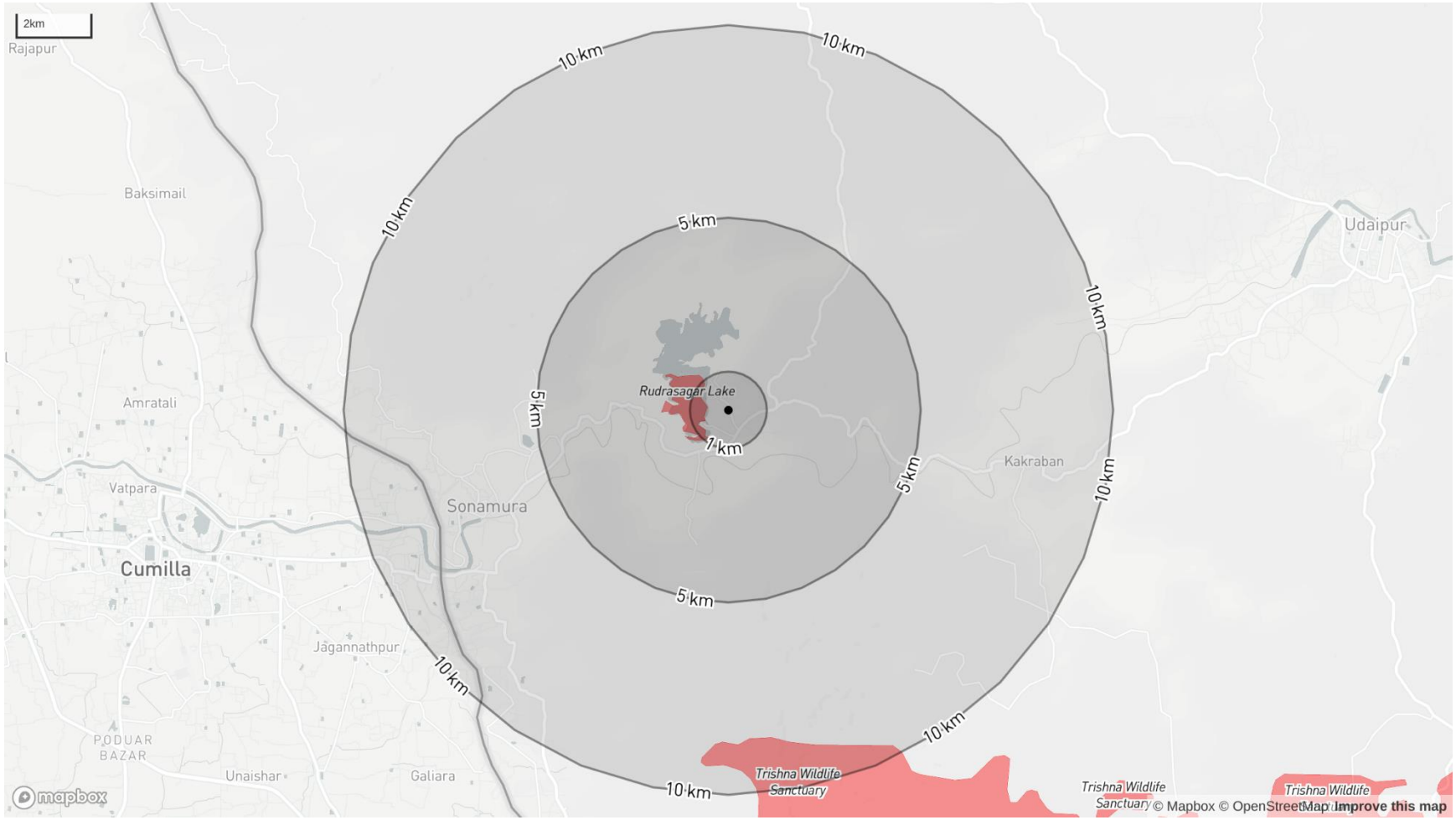


Figure 74: Key biodiversity areas and Protected Areas in proximity to proposed components in Belonia town

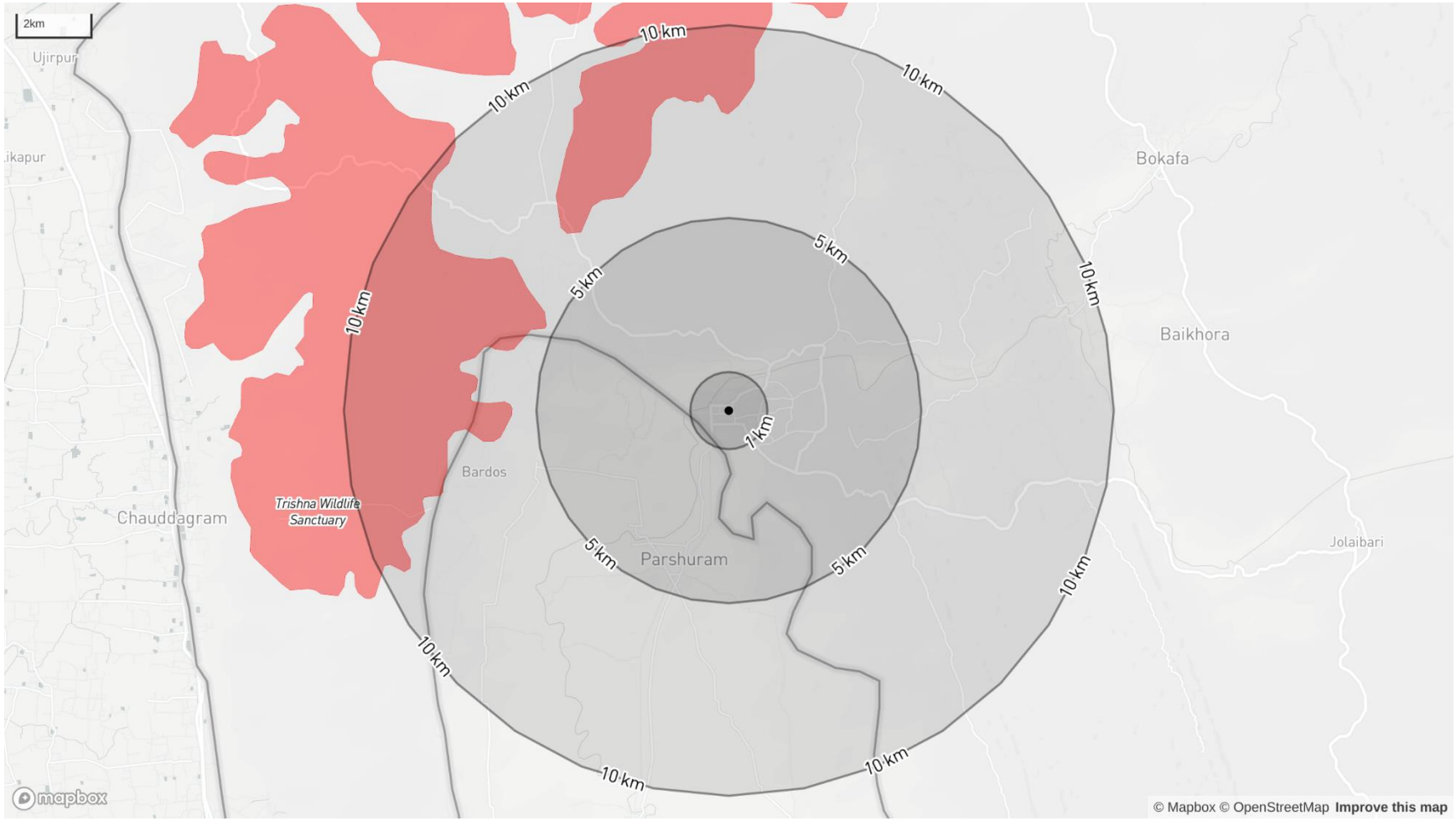


Figure 75: Land use map of Udaipur town

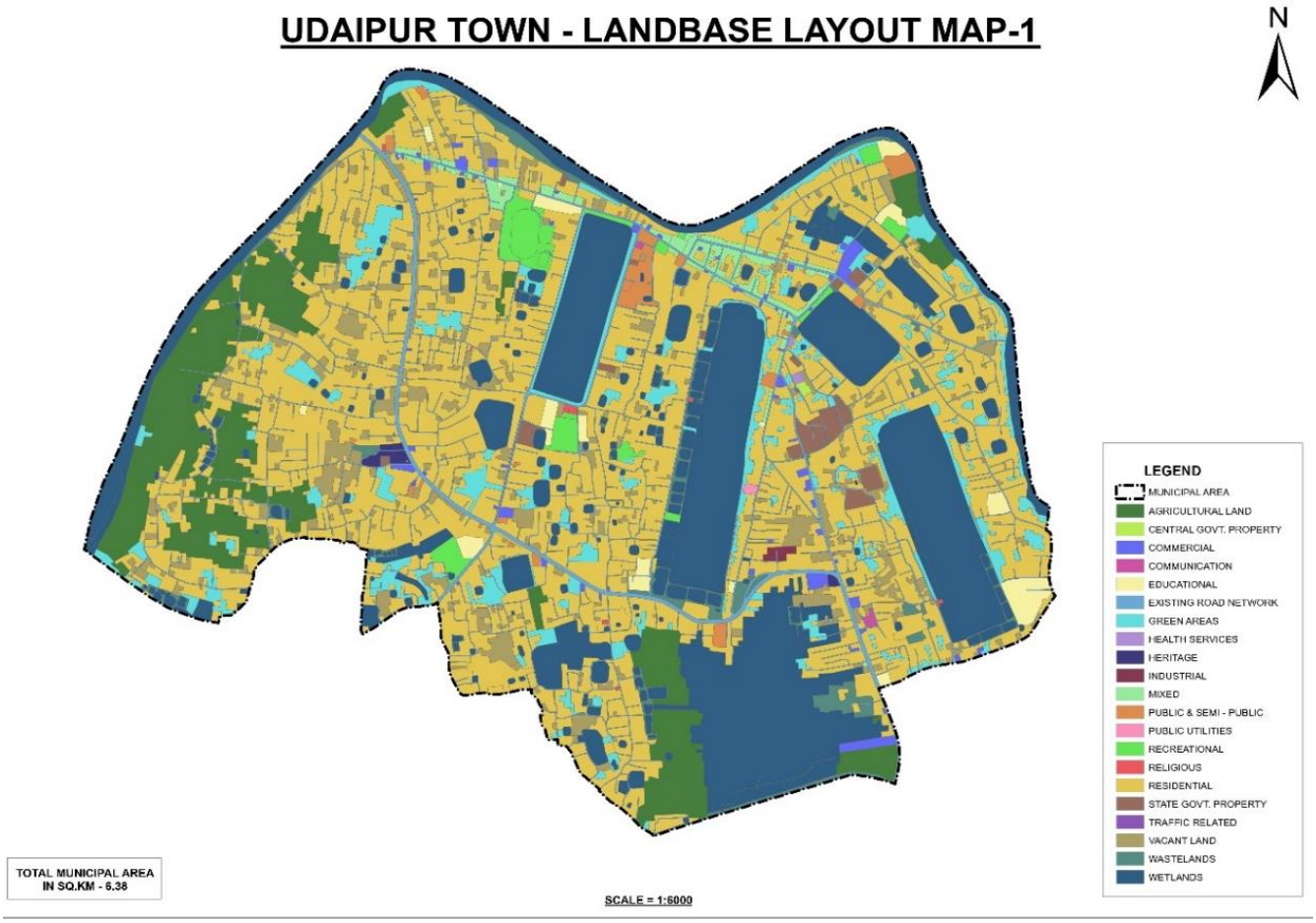


Figure 76: Land use map of Amarpur town

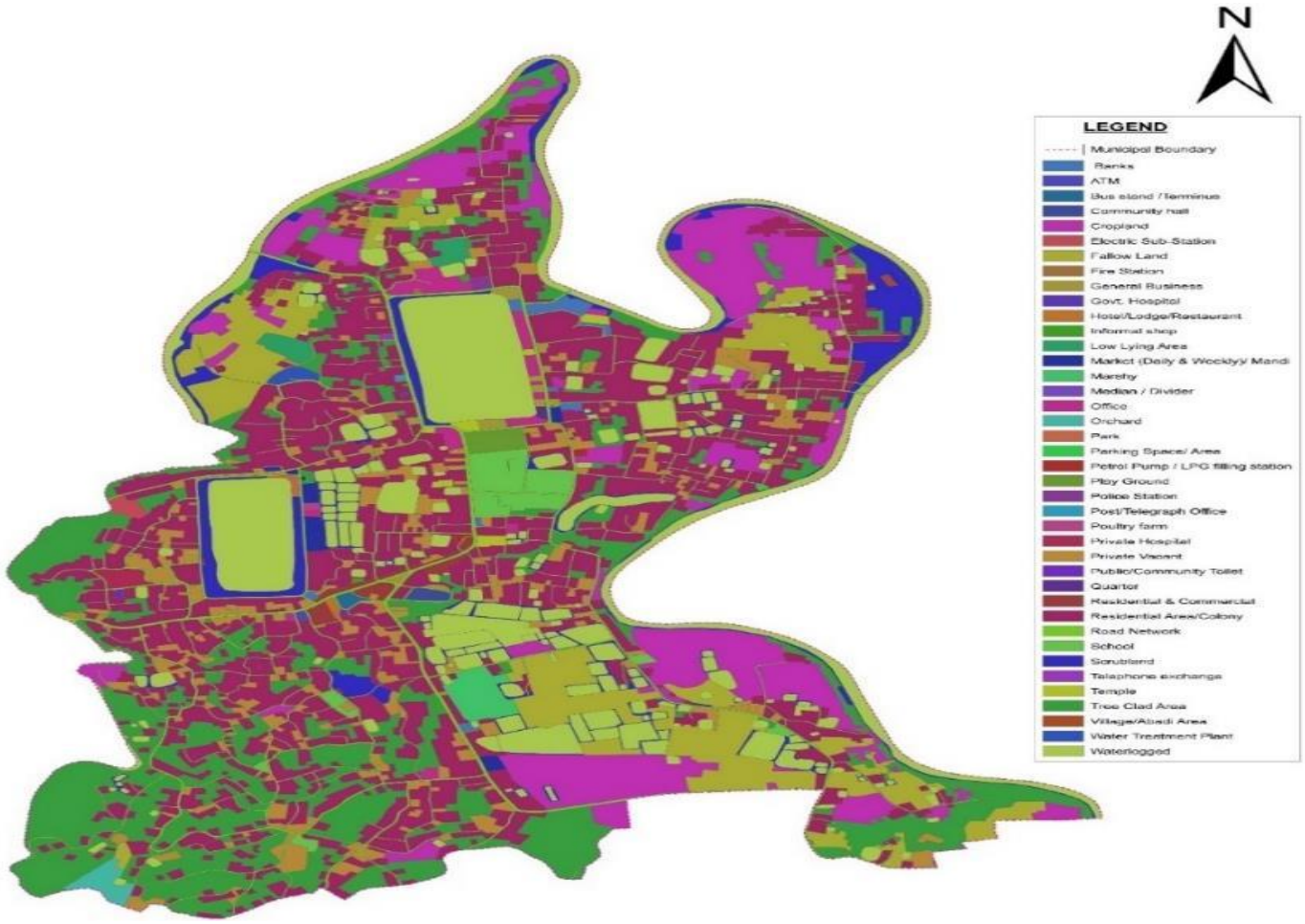


Figure 77: Land use map of Bishramganj

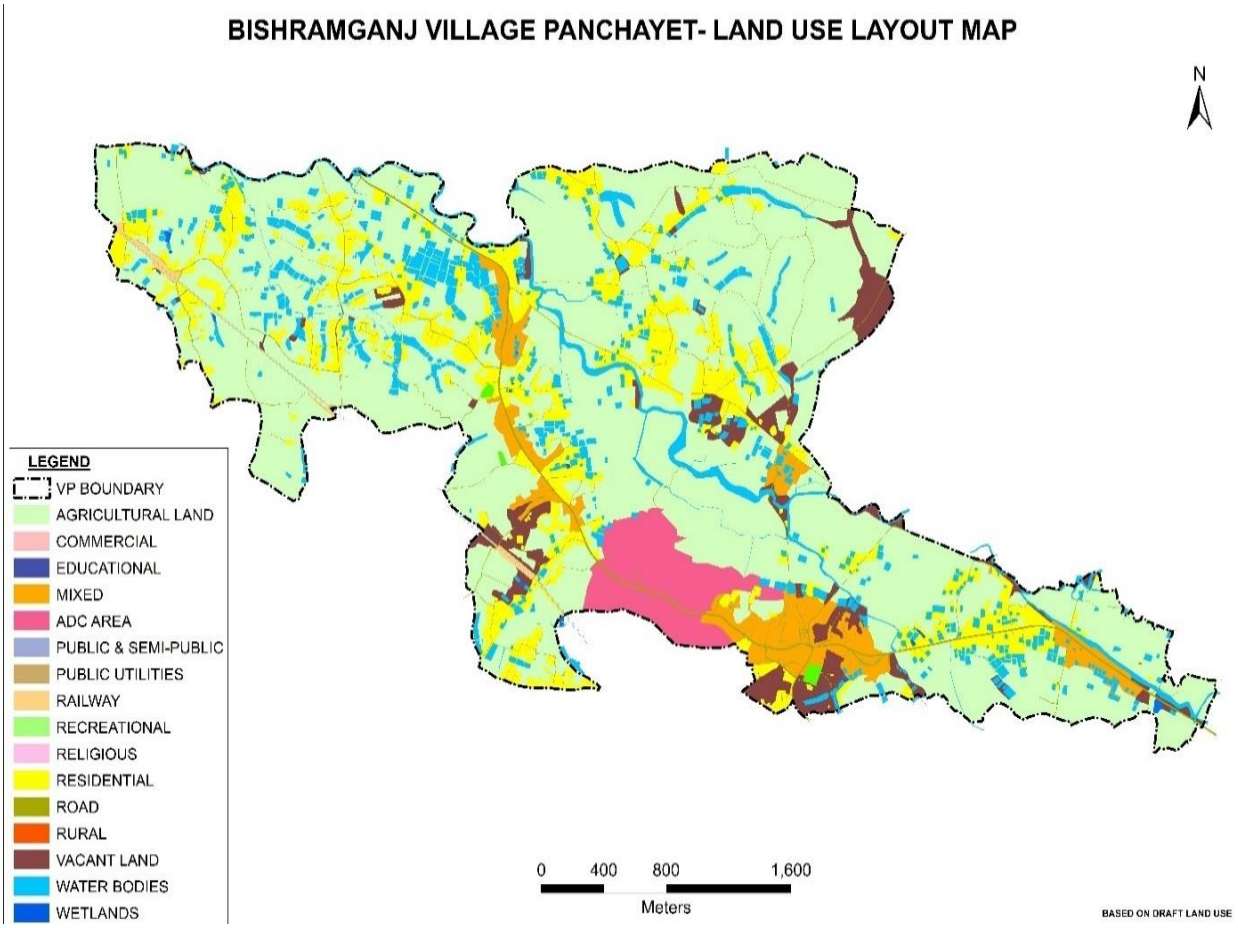


Figure 78: Land use Map of Melaghar

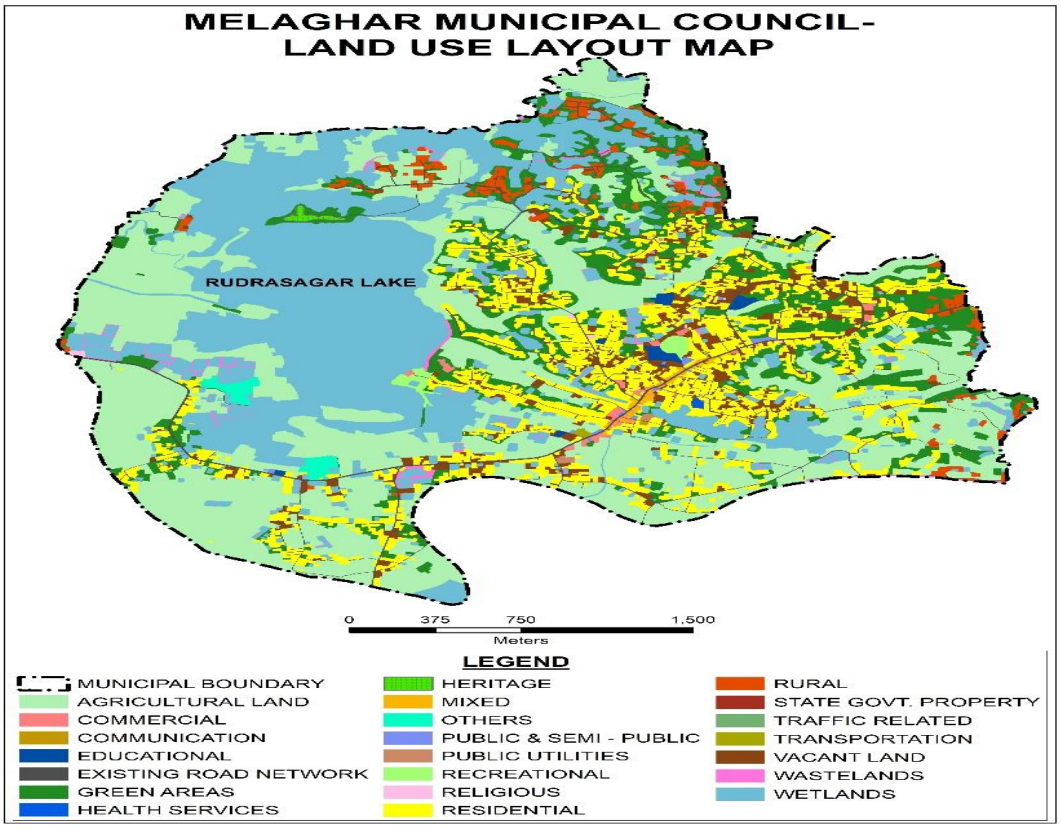


Figure 79: Land use Map of Belonia Industry

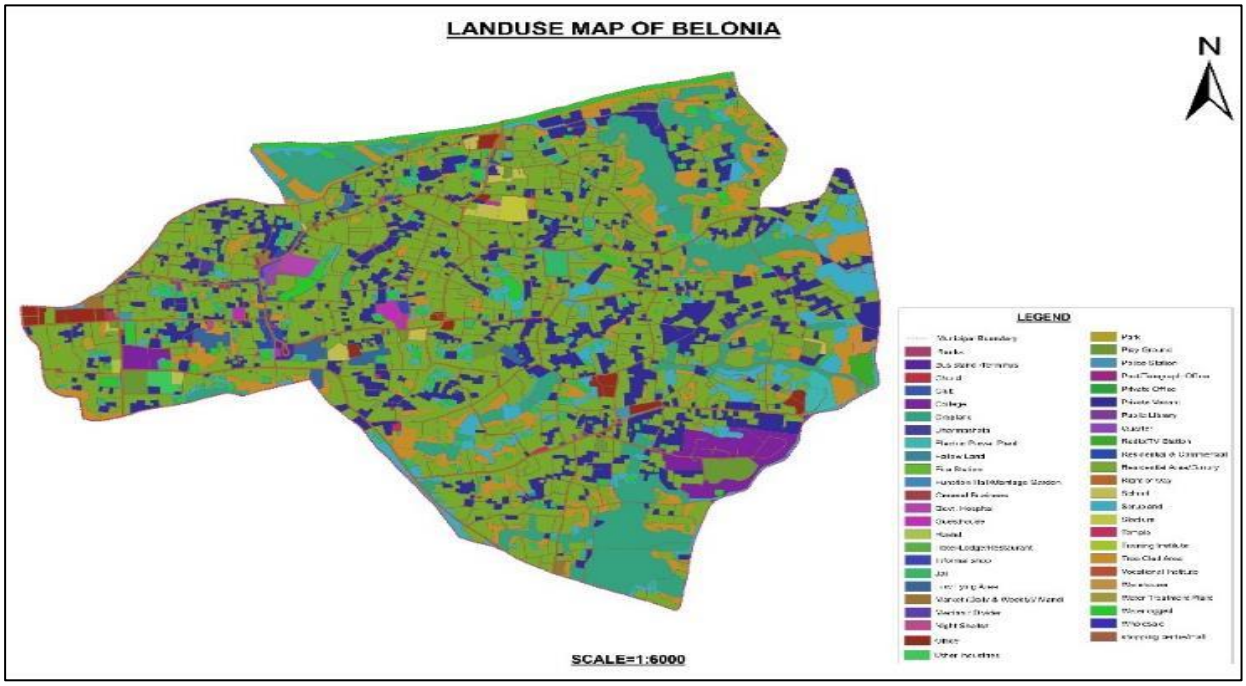


Table 10: List of Industrial Areas in Udaipur

Sr no.	Name of Industrial area	Location	Area (in ha)
1	Industrial Estate, DIC(G)	Dhajanagar, Udaipur, Gomati Tripura	11.29
2	Udaipur,I.T.I.	Dhajanagar, Udaipur, Gomati Tripura	7.34
3	I.I.D.C; Gokulpur	Gokulpur, Udaipur, Gomati, Tripura	29.11

Table 11: Details of the industries in and around Udaipur is given below.

SL. NO.	INDUSTRIAL ESTATE	DETAILS
1.	Dhajanagar Industrial Estate	Functioning - 04 Under implementation - 05 Closed - 01 Types of Industries: Agarbatti Manufacturing unit, Maruti Service Centre, Iron Fabrication & Steel Furniture, Rubber Industry, Flour Ill, Paper Plate & up, Drinking water Manufacturing unit, Food Processing Unit, Mini Dairy Plant, etc.
2.	Bamboo Cluster Incense Stick	Rolled Agarbatti/ Bamboo stick
3.	Bamboo Cluster	Handicraft Items
4.	Bio-fertilizer production centre	Bio-fertilizer
5.	Cold Storage (Potato, Fruits & Vegetable)	2000 MT
6.	Rubber Plantation	Rubber
7.	Gas based thermal power project	726.6-MW Plant at Palatana near Udaipur

Amarpur, Melaghar and Bishramganj

55. In Melaghar and Amrpur products include bamboo sticks and handicrafts items. There are no major industries in Bishramganj.

Table 12: List of Industrial Areas in Belonia Town

Sl.No.	Industrial Estate	Details
1.	IIDC Sarasima	Functioning - 03 Under implementation - 02 Types of Industries: Sawmill, Stone crushing, Rice Mill.
2.	Rubber Industry	NHMP Multi-production Industries Hrishyamukh, South Tripura.
3.	Bamboo Cluster	Rolled Agarbatti.
4.	Cold Storage (Potato, Fruits & Vegetable)	2000 MT

Table 13: Proposed components near ASI protected Chaturdasha Devta Temple

Sl. no	Proposed Components	Ward Number	Distance (aerial distance) from the Chaturdash Devta Temple
1	Proposed Overhead water storage reservoirs	Ward No. 07	1310 meters
2	Proposed CWTM	Ward No. 09	290 meters
3	Proposed RWTM	Outside Municipality	1825 meters
4	Proposed Distribution line of 125 mm HDPE	Ward No. 07	57 meters
5	Proposed Distribution line of 125 mm HDPE	Ward No. 6	93 meters
6	Proposed Distribution line of 250 mm HDPE	Ward No. 6	102 meters
7	Proposed Distribution line of 125 mm HDPE	Ward No. 6	212 meters
8	Proposed Distribution line of 125 mm HDPE	Ward No. 7	282 meters
9	Proposed Distribution line of 125 mm HDPE	Ward No. 6	262 meters
10	Proposed Distribution line (REMODEL) of 225 mm HDPE	Ward No. 6	234 meters

Table 14: Proposed components near Gunavati group of temples

Sl. no	Proposed Components	Ward Number	Distance (aerial distance) from the Gunabati Group of Temple
1	Proposed Overhead water storage reservoirs	Ward No. 07	1657 meters
2	Proposed CWTM	Ward No. 09	553 meters
3	Proposed RWTM	Outside Municipal Boundary	1303 meters
4	Proposed Distribution line of 140 mm HDPE	Ward No. 08	38 meters
5	Proposed Distribution line of 140 mm HDPE	Ward No. 08	71 meters
6	Proposed Distribution line of 180 mm HDPE	Ward No. 07	135 meters
7	Proposed Distribution line of 180 mm HDPE	Ward No. 07	187 meters
8	Proposed Distribution line of 160 mm HDPE	Ward No. 08	108 meters
9	Proposed Distribution line of 125 mm HDPE	Ward No. 09	224 meters
10	Proposed Distribution line of 125 mm HDPE	Ward No. 09	285 meters

Figure 80: ASI Monuments in Udaipur

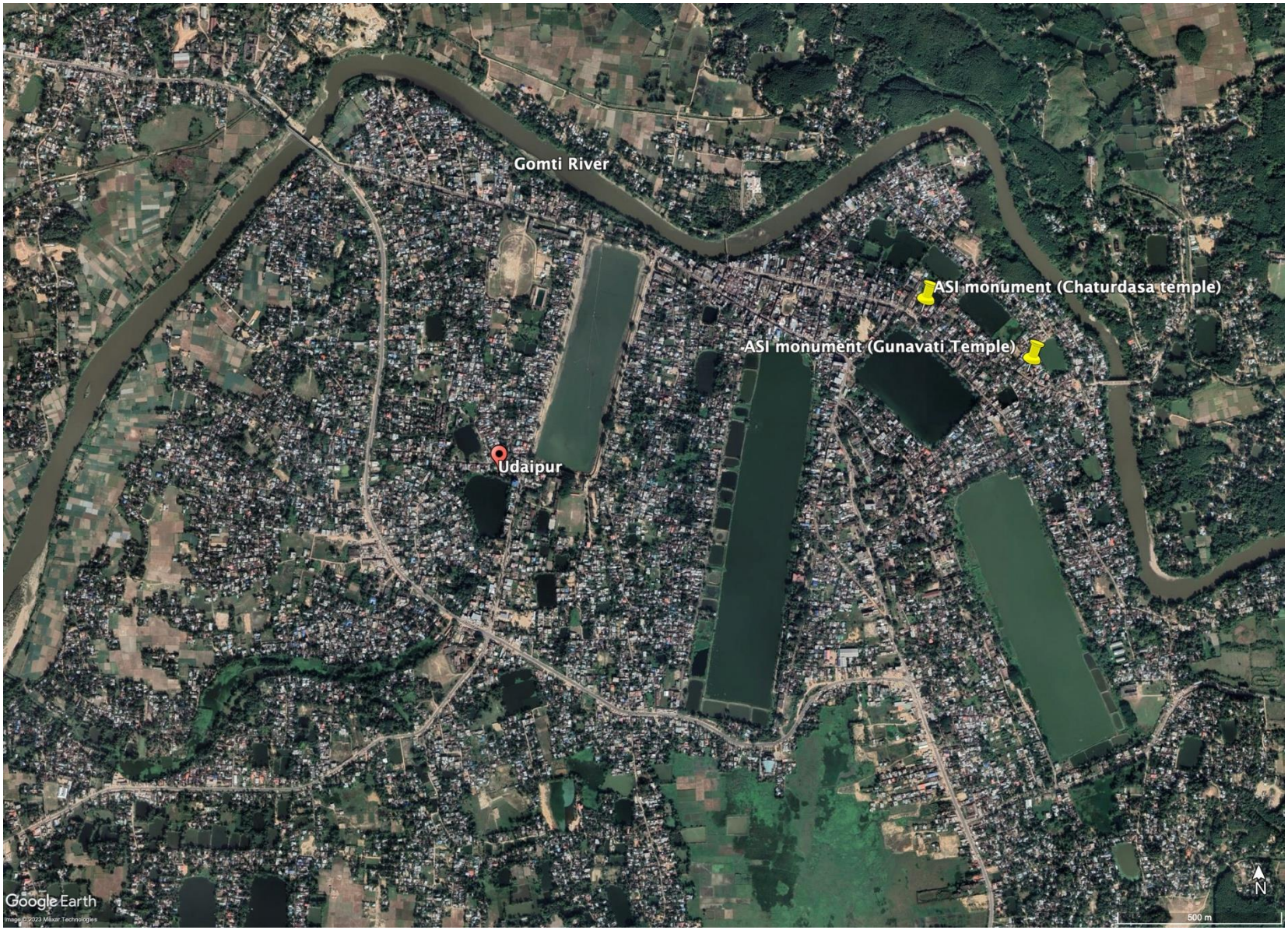
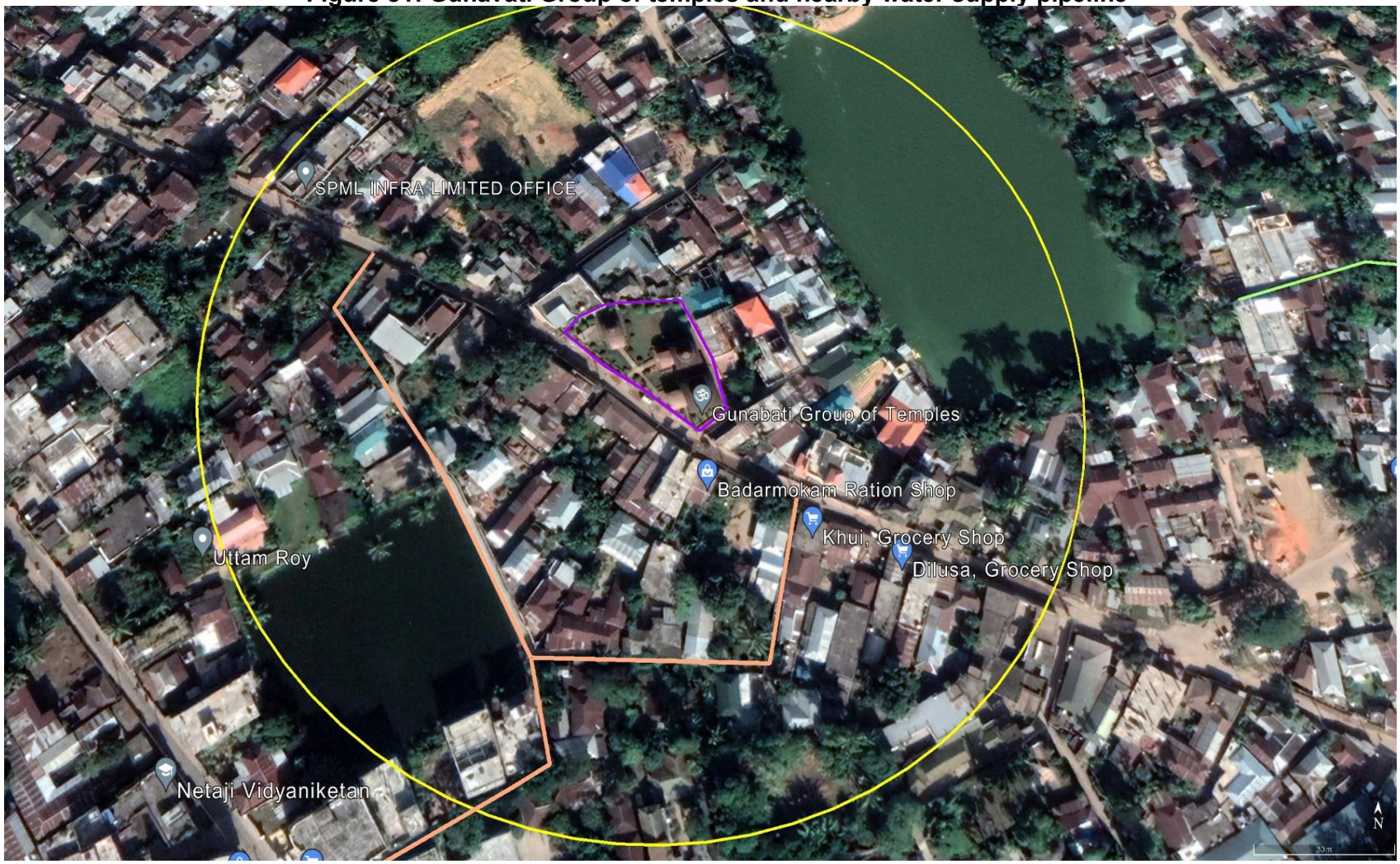
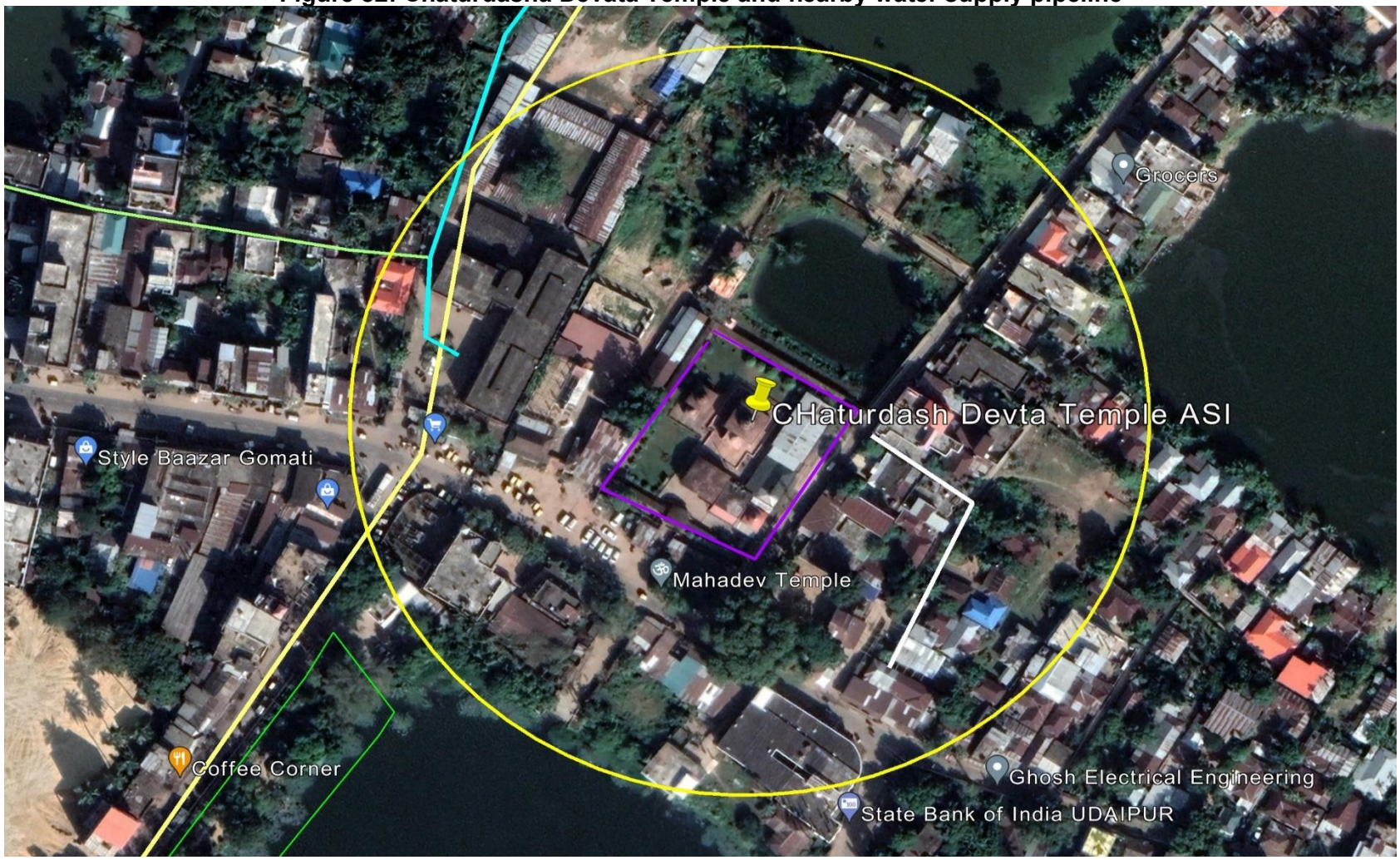


Figure 81: Gunavati Group of temples and nearby water supply pipeline



			Temple boundary
	100 m circle from ASI monument		140 mm Water Supply pipeline

Figure 82: Chaturdasha Devata Temple and nearby water supply pipeline



			Temple Boundary
	100 m distance from ASI monument		125 mm Water Supply Pipeline
	225 mm Water Supply Pipeline		180 mm Water Supply Pipeline

Figure 83:ASI Protected Chaturdasha Devata temple

Drone photograph - Source: National Monument Authority Heritage bye-laws 2020 of Centrally Protected Monument Chaturdasha Devata Temple.

Figure 84: ASI protected Gunavati Group of temples

Drone Photograph of temple (Source: National Monument Authority Heritage bye-laws 2021 of Centrally Protected Monument Gunavati Group of Temples, Radhakishorepur, Gomati.)

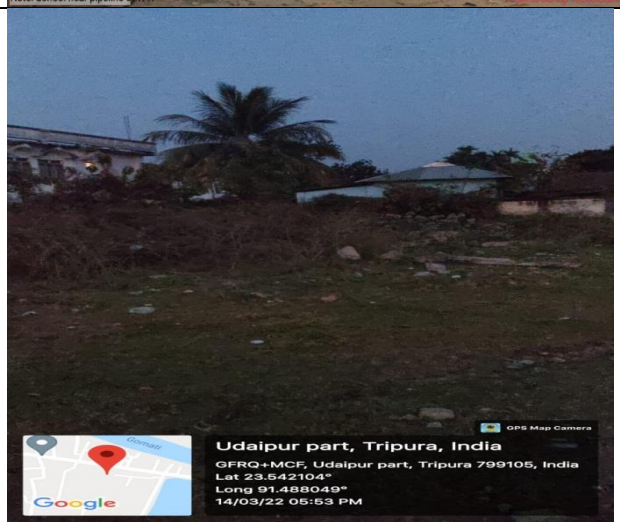
C. Subproject Site Environmental Features

56. Features of the selected subproject sites are presented in the following table.

Table 15: Site Environmental Features -Udaipur

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
1.	Proposed Intake well at Gomati River Lat: 23.533623° Long: 91.513081°	Intake well proposed on the bank of Gomati River. There is an existing intake well which is approx. 500 m away from the proposed one. The Proposed intake is located south eastern side of the town. The nearest settlement from the proposed site is 100 m. Proposed intake well will construct on River Gomati and other related infrastructure into a rubber garden. There will be approx. 10 numbers of Rubber trees (*Hevea brasiliensis)* felling may be required for construction of the intake well support infrastructure. But actual location will be selected during finalization of location by DBO contractor. The required land area to construct the proposed electric substation room, guard room etc. will be around 60-80 sq.m. There is no nearby designated forest area in and around the proposed project site. Earthen and brick road is available in the village which will be used during the construction activity and transportation of materials. But permanent approach road is required upto intake. Soil type of this area is Red loam and sandy loam soils.	  

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
2.	Prop 400 DI Rising Main Raw water transmission line in Banduar Village	Raw Water Transmission pipelines will be mostly laid along the existing road within the available RoW. There is a *nalla* crossing of pipeline through a bridge (design will be developed by DBO contractor) The transmission main leading to Intake well to WTP, the land owned by Government. No sensitive receptor exists closer/within the proposed site and no tree cutting will be required. Land use around the site is residential.	
3.	WTP site at Banduar Village within existing WTP complex Lat: 23.529060° Long: 91.515626°	The proposed WTP site is located near the existing WTP. Location is outside the municipal boundary. The site is open and clear. No tree felling is required for construction activity. Cleaning of scrub may be required. The site is predominantly flat, with some undulating area, vacant, and sparsely covered with shrubs and bushes. The proposed WTP is within the existing WTP campus. Though some low-tension line crosses the proposed area but utility shifting is not required for the construction activity. There is an internal road but approach road to the site needs to be constructed before start of construction The nearby settlement from the proposed land is approximately 30-40 m. Staff quarter located nearby. There is no forest land near proposed WTP site. The proposed WTP is located south eastern side of the town. Soil type of this area is Red loam and sandy loam soils.	

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
4.	Clear water Rising Main pipeline alignment	Clear water rising mains will be connected with the proposed OHSRs and one existing OHSR. The pipeline will be laid along the existing road in the available RoW. Clear water rising mains having variable dia.	
5	OHSR 1 in Udaipur Girl's HS School/ Bhagini Nibedita School (Ward no. 3) Lat: 23.542400° Long: 91.487426°	The 900-kilo liter (kl) OHSR will be constructed inside the Udaipur Girls School / Bhagini Nibedita School Campus. 400 sq m land will be required for construction of OHSR. The land parcel identified for OHSR 1 at Udaipur Girl's School is vacant and free from vegetation. Surrounding land area mostly used in habitation purpose in area. No tree felling is required for construction activity. No wild fauna is reported on site. The proposed site for the OHSR is located at North Western part of the town. The main school building from the proposed OHSR location is approximately 100m. No waterbody nearby. During the construction noise and dust pollution may be an issue. Measure should be taken during the construction period. Land use around the site is residential.	 

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
6	OHSR 2 in Ramesh HS School Playground (Ward no. 19) Lat: 23.530580° Long: 91.484677°	The 750-kilo liter (KL) OHSR will be constructed in the playground of Ramesh HS School. The proposed site for the OHSR is located at South Western part of the town. Proposed OHSR site is free of vegetation cover and land is vacant. Trees are located at peripheral area of the land, but tree felling requirement will be finalized after finalization of design by DBO contractor. No additional impact on structures is anticipated at the site. The main school building from the proposed OHR location is approximately 65m. There are no designated forest areas around project area. There is an existing drain near the proposed OHSR site, which will be not affected. During the construction noise and dust pollution may be an issue. Measure should be taken during the construction period. Land use around the site is residential.	 
7.	Water Distribution Network in Giridhari Pally (180 mm HDPE)	Pipes will be laid within the road right of way (ROW) - in road's earthen shoulder in wider roads, and within the carriageway in narrow roads, where there is no space. No tree cutting will be required as per preliminary design. No wildlife is being reported within the proposed water distribution network area. No environmentally sensitive areas in or near the alignment of distribution network lines are proposed.	

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
8	Water Distribution Network near OHSR-2 (180 mm HDPE)	The pipeline will be laid along the road within the ROW. In left hand side of the road concrete drain observed. There are no trees along the road. Land use around the site is residential.	

Table 16: Site Environmental Features - Amarpur

Sl. no	Infrastructure	Location & Environmental Features	Site Photograph
1	Distribution Network near OHT-1 at Amarpur Jail Road	Pipes will be laid within the road right of way (ROW) – in road's earthen shoulder in narrow roads, and within the carriageway in narrow roads, where there is no space. There are no trees along the road. There are no notable sensitive features in and around the network laying area	
2	Distribution Network in Sukumar Colony	Pipes will be laid within the road right of way (ROW) – in road's earthen shoulder with concrete drain in both sides of roads, and within the carriageway in narrow roads, where there is no space. There are no trees along the road. Land use around the site is residential	

Sl. no	Infrastructure	Location & Environmental Features	Site Photograph
3	Distribution Network near Amarpur Subdivision Hospital	Pipes will be laid within the road right of way (ROW) - in road's earthen shoulder in wider roads, and within the carriageway in narrow roads, where there is no space. Roads near Amarpur Subdivision Hospital are quite broad everywhere and pipelines can be laid easily by the side of road on the earthen shoulder. Special care should be taken during the construction period to mitigate dust and noise pollution.	
4	Distribution Network near existing OHT at Sankarpalli	Pipelines will be mostly laid along the main roads. Pipes will be laid underground. There is a School and Anganwadi near the pipeline. Special care should be taken during the construction period to control the noise and dust pollution. Land use around the site is residential.	
5	Distribution Line Near Kulabag High School	Pipes will be laid within the road right of way (ROW) - in road's earthen shoulder in wider roads, and within the carriageway in narrow roads, where there is no space. The site is surrounded by residential area. Pipe will be laid near the school gate. All precautions will be taken during laying of pipe.	

Table 17: Site Environmental Features - Bishramganj

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
1	OHSR-1 and IRP location at Chesrimai, RSB Colony (Ward No.5) Lat- 23.623259° Long- 91.318856°	The proposed OHT site is located at Chesrimai, RSB Colony. The proposed site is located within the Anganwadi playground. The site large enough to construct the OHT and green buffer should be developed all around the site. One number of sunk DTW adjacent to the proposed site has been observed during the site inspection. The proposed site is surrounded by rubber plantation and residential area. There is no tree available on the site and hence no tree felling is required. At present, there is a Camphor tree near the proposed site which will not affected due to construction of OHT. No drain is noted near the site. The nearby settlement is approximately 10m from the site. There is no nearby forest area and no wild life has been reported in and around the site. Land use around the site is residential. Proposed OHT located on north western part of the town. There is a bitumen road near the proposed site.	 
2.	OHSR-2 and IRP location at Purba Barjala, Barjala (Ward No.3) Lat- 23.625401° Long- 91.342556°	The proposed OHSR site located at Purba Barjala. Proposed land is vacant, unused land with no tree cover. Although the site is vacant but few trees are present at peripheral of the site which are not part of the proposed site. Site doesn't come under flood prone area or low-lying area as confirmed by local people. The nearby settlement from the proposed land is approximately 10 m. There is no drainage line near the proposed site. Land use around the site is residential.	

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
		No trees are available on the land which requires to fell for the construction activity. Proposed OHT located on north eastern part of the town. Access needs to be constructed from main road.	
3.	OHSR-3 location at Bishramganj office of CSC District Manager, Sepahijala Tripura (Ward No.8) Lat- 23.607606° Long- 91.345721°	OHT will be construct at Bishramganj, near CSC District Manager office. The proposed land area is adequate to construct the OHT. Site is vacant with shrubs and bushes; few numbers of government office property is located about 10-15 m from the proposed site. Proposed OHT located on southern part of the town. There is a bitumen road near the proposed site. No trees are available on the land which requires to fell for the construction activity. There are no notable or significant archeological places or protected monuments or areas in and around project area. Hence no environment impact Expected.	
4.	Distribution network (90 mm HDPE) at Amtoli, Ward no.-3	Pipes will be laid along the earthen foot road. Pipe will be laid in the middle of the road. In this section there are ponds on both sides of the road. Piling should be completed before the pipe laid. No tree felling is involved as per the preliminary survey. There is no forest land involved in this as there is no forest areas across the entire length of proposed alignment.	

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
5	Water Distribution Network (160 mm HDPE) near Bishramganj, Takarjala Road, Ward no-3	Pipes will be laid within the road and within the carriageway in narrow roads, mostly passing through agricultural lands. The pipes will not traverse any private land across the entire length of the proposed alignment. Land use of this area is majorly agricultural and residential.	
6	Water Distribution Network near Bishramganj, Ramkrishna Pally (Ward No. 08)	90 mm Dia distribution pipelines will be laid within the RoW of a brick road. Existing road is quite narrow and land use of this area is residential. There are no trees along the road. In this narrow road, there is no space, pipes will be laid in the road carriage No sensitive receptor exists closer/within the proposed site	
7.	Water Distribution Network (90 mm HDPE) near Chesrimai RSB colony. (Ward No. 05)	Water supply pipelines will be laid within the mud roads paving way to the habitations. Land use of the area is mainly residential. The road is present within rubber plantation area. Precaution should be taken during the construction to avoid felling of trees. No environmentally sensitive areas in or near the alignment of distribution network lines are proposed	
8.	Proposed CWTM 100 mm DI at Chesrimai. (Ward no. 03)	Pipe line passing through a Rubber plantation area. The pipe will be laid within the brick road. The pipes will not traverse any private land across the entire length of the proposed alignment. No environmentally sensitive areas in or near the alignment of distribution network lines are proposed.	

Table 18: Site Environmental Features - Melaghar

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
1.	OHSR location near Radhamadhabpur JB School – Ward no 1 Melaghar Lat: 23.509866, Long: 91.332947	Overhead Reservoir of 450 KL capacity will be constructed in ULB land. Proposed OHSR located on Northeastern part of the town. There is a bitumen road near the proposed site. Proposed project site is more or less in flat terrain. There is no drainage line near the proposed site. There is a transformer and Tube well near proposed site, which will be not affected. At present, there is no existing trees on the proposed project site. The proposed site is surrounded by rubber plantation and residential buildings. Nearest habitation in approximately 50 m away from the project site. Radhamadhabpur JB School is located about 50 m from proposed site. Behind the site, there is a pond, so proper measures should be taken to avoid any soil erosion. Proposed OHT is located approximately 1 Km away from the Rudrasagar lake.	 
2.	Water Distribution Network near Chandigarh, Melaghar (Ward no.03)	Water supply pipelines will be laid within the RoW of PWD roads. Land use of the area is mainly residential. The road passes through an area comprising of School, Health Centre, Durga Mandir and Tehsil Office. The public will be intimated prior the implementation period. Contractor shall execute the work during holidays to avoid disruption due to noise. No trees are present along the road side.	

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
3.	Water Distribution Network near Thakurpara (Ward no. 12)	The alignment of distribution lines is such to ensure maximum nearby household connections. Pipe will be laid in the katcha pathways and streets of the habitations. Hence, temporary social issues may arise while laying the pipes near the houses. Hence, land use of the area is mainly residential. Since the pipelines will go underground (where possible), its less likely to impact any household permanently.	
4.	Water Distribution Network near Chandigarh, Melaghar (Ward no. 03)	Water supply pipelines will be laid within the earthen roads. The land use of the area is mainly residential. Few areas adjacent to the road are used for rubber plantation. The Pipes will be laid in a manner so that no cutting of the trees is required. No such specific environmental impact is foreseen.	
5	Water Distribution Network in Ward no. 6	Distribution line will be laid within the brick road. Existing road is quite narrow and land use of this area is residential. There is a pond near the proposed distribution line. There are no trees along the road. No environmentally sensitive areas in or near the alignment of distribution network lines are proposed.	

Table 19: Site Environmental Features - Belonia

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
1.	Deep Tube Well-1, IRP and OHSR-2 Beside Nightangle Shelter House. (Ward no. 12) Lat- 23.248611° Long- 91.453906°	Deep Tube Well with IRP and OHSR-1 will be constructed. The tube wells will be installed at same location. The site is open and clear. There is no tree available on the site and hence tree felling is required. Scrub land is located nearby the site. Land use around the site is residential. The proposed DTW is situated western side of the town. Nearby residential area is 30m away from the proposed project site. There is low land and nalla nearby the site.	
2.	Deep Tube Well-2, IRP inside the Ishwar Chandra Vidyasagar College/ICV campus (Ward no. 16) Lat- 23.243078° Long- 91.472519°	Deep Tube Well with IRP will be installed inside the college campus. There is no nearby forest area in and around the proposed project site. Around 5 numbers of rubber trees may be cut for the construction activity. But actual assessment can be done after finalization of exact location of tube well and IRP. The proposed DTW location is 10m away from a existing OHR. Nearby College building is more than 50 meters away from the proposed site. There is no notable or significant archeological places or protected monuments or areas in and around project area. Proposed site is located southern part of the town.	

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
3.	Deep Tube Well-3, IRP near Narayan Smriti Anganwadi Center & Giridhari Ashram (Ward no. 14) Lat- 23.244458° Long- 91.463628°	Deep Tube Well with IRP will be installed backside of Narayan Smriti Anganwadi Center which (now not in use). There is no nearby forest area and no wild life has been reported in and around the site. Land use around the site is residential. Approximately 5-6 numbers of rubber trees may be cut due the construction work. But actual assessment can be done after finalization of exact location of tube well and IRP. One septic tank also observed around the proposed DTW site, currently it's not in use as Anganwari is closed. There is no waterbody near the proposed site. The nearby Anganwadi center from the proposed land is less than 10 m. Giridhari Ashram is located about 225 m from the proposed DTW. Proposed site is located south-western part of the town. Measures should be taken as during the construction period to control the dust and noise level.	 
4	Deep Tube Well-4, IRP near DM office (Ward no. 15) Lat- 23.246128° Long- 91.468889°	Deep Tube Well with IRP will be installed near DM office. DM office building is approx. 20m away from the proposed DTW location. The land parcel is almost flat and not under any productive use. No sensitive receptor exists closer/within the proposed site and no tree cutting will be required. Land use around the site is residential. Proposed DTW is situated middle of the town.	

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
5	OHSR 1 and DWT 5, IRP near Satmura S.B. School/ All India Radio (Ward no. 16) Lat- 23.246361° Long- 91.468861°	Deep Tube Well with IRP and OHSR-2 will be installed near Satmura S.B. School/ All India Radio. The land parcel identified for OHSR at Satmura is covered by vegetation and Approx. 7-8 numbers of rubber trees will be cut during the construction. But actual assessment can be done after finalization of exact location of OHSR, tube well and IRP. There is no drainage line near the proposed site. There is no waterbody near the proposed site Satmura S.B. School is nearly 265 m away from the proposed site. Land use around the site is residential. Proposed site is located southern part of the town.	
6	Water Distribution Network in 1 no. Tilla (180 DI)	Water supply pipelines will be laid within the RoW of PWD roads. Roads in the 1 No. Tilla is quite congested and land use of this area is commercial. There are no trees along the road. No sensitive receptor exists closer/within the proposed site.	
7.	Water Distribution Network near OHSR-1 (Proposed CWTM 180 mm DI)	Pipes will be laid within the road right of way (RoW) - in road's earthen shoulder in wider roads, and within the carriageway in narrow roads, where there is no space. There are no trees along the road. There is no notable or significant archeological places or protected monuments or areas in and around project area Land use of this area is residential.	

Sl. no	Project Component and location	Environmental Features of the Site	Photograph
8.	Water Distribution Network in Nutun Pukur Para (180 mm HDPE)	Pipe line passing through a congested residential area.. No tree cutting will be required as per preliminary design. No wild life has been reported within the proposed water distribution network area. No environmentally sensitive areas in or near the alignment of distribution network lines are proposed.	

Table 20: Sensitive Receptors in the Project Influence area - Udaipur

Sl. no	Name of structure	Location	Approximate Distance from construction activity	Photographs
1	School	Fulkumari	5 m	
2	School	Fulkumari	25 m	

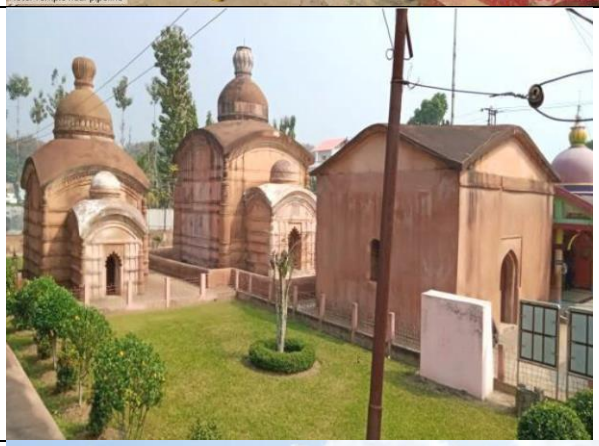
Sl. no	Name of structure	Location	Approximate Distance from construction activity	Photographs
3	Temple	Mahatma Gandhi Road	5 m	
4	ASI protected temple	Chaturdash devta temple	57m	
5	ASI protected temple	Gunavati group of temples	38m	

Table 21: Sensitive Receptors in the Project Influence area – Amarpur

Sl. no	Name of the Structure	Location	Approximate Distance from construction activity	Photographs
1	Madrasa	Chan Miya Junior Madrasa	More than 30m	
2	School	Kulabag High School	Main Building of the school is more than 30m away from the proposed site	
3	School	Anganwadi school	More than 30m	

Sl. no	Name of the Structure	Location	Approximate Distance from construction activity	Photographs
4	School	Anganwadi school in Sankarpally	Less than 20m from the construction site.	
5	Masjid	Near Kulabag	More than 30m	
6	Temple	In Birbaldas Para	Adjacent to the road	
7	Temple	In Sankar pally	Adjacent to the road	

Table 22: Sensitive Receptors in the Project Influence area – Bishramganj

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
1.	Anganwadi School	Bishramganj Joorpukur	Within 2 meters	
2.	College	Bishramganj	Within 50 meters	
3.	Anganwadi	Chesrimai	Within 20 meters	
4.	School	Chesrimai	10 m from the road	

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
5.	Anganwadi	Chesrimai	Within 15 meters	
6.	Hospital	Bishramganj	Within 50 meters	
7	Hospital	Chesrimai Health and Wellness center	Adjacent to the road	
8.	Shani Mandir	Madhya Barjala	Within 2 meters	

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
9.	Temple	Chesrimai	Adjacent to the road	

Table 23: Sensitive Receptors in the Project Influence area - Melaghar

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
1.	School	Chandigarh	Adjacent to the road	
2.	School	Mohanbhog	Within 5 meters	
3.	Hospital (Health Centre)	Chandigarh	Within 25 meters	

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
4.	Temple (Durga Mandir)	Chandigarh	Within 40 meters	
5.	Temple	Melaghar Main Road	Adjacent to the road	
6.	Temple	Thakurpara	Within 2 meters	
7.	Temple	Chandigarh	Within 1 meter	

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
8	Ramsar site	Rudrasagar lake	Within 50 m	

Table 24: Sensitive Receptors in the Project Influence area – Belonia

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
1	School	Hall Chowmuhani	Less than 5m	
2	School	Netaji Palli	Less than 5m	

Sl. no	Name of structure	Location	Approximate Distance from construction activity site	Photographs
3	College	Inside Iswar Chandra Vidyasagar College Campus	Adjacent to road	

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

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

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

(i) **Location impacts** include impacts associated with site selection and include loss of on-site biophysical array and encroachment either directly or indirectly on adjacent environments. It also includes impacts on people who will lose their livelihood or any other structures by the development of that site.
(ii) **Design impacts** include impacts arising from Investment Program design, including technology used, scale of operation/throughout, waste production, discharge specifications, pollution sources and ancillary services.
(iii) **Pre-construction impacts** include impacts which are anticipated during construction works but planning is required for proposed mitigation measures before start of construction works i.e. during SIP period such as taking consents from various departments, planning for construction and workers camps, deployment of safety officer, arrangement of required barricades and caution boards etc.
(iv) **Construction impacts** include impacts caused by site clearing, earthworks, machinery, vehicles and workers. Construction site impacts include erosion, dust, noise, traffic congestion and waste production.
(v) **O&M impacts** include impacts arising from the operation and maintenance activities of the infrastructure facility. These include routine management of operational waste streams, and occupational health and safety issues.

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

60. This section of the IEE reviews possible project-related impacts, in order to identify issues requiring further attention and screen out issues of no relevance. ADB SPS (2009) require that impacts and risks will be analysed during pre-construction, construction, and operational stages in the context of the project's area of influence. The ADB Rapid Environmental Assessment Checklist (**Appendix 1)** has been used to screen the project for environmental impacts and to determine the scope of the IEE.

B. Design and Location Impacts

61. **Design and Location of the Proposed Components**. Technical design of the (i) intake facilities at river; (ii) raw water main, (iii) water treatment plant with clear water reservoir; (iv) clear water mains, (v) Intermediate Overhead Water Storage Reservoirs and other items like water distribution network, flow meters, follows the relevant national planning and design guidelines, focusing on providing a robust system which is easy to operate, sustainable, efficient and

economically viable. Following environmental considerations are included in the project:

(i) Improving water supply system with ground water-based sources (Deep Tube Wells) in Bishramganj and Belonia towns to meet the present and projected water demand
(ii) Improving water supply system with Surface water-based sources (River intake and WTP) in Udaipur towns to meet the present and projected water demand
(iii) Designing the entire system to maintain optimal flow and terminal pressure, and optimizing the overall energy usage;
(iv) Reducing the incidence of water borne diseases by providing 100% population including urban poor with potable water supplies;
(v) Preparation and implementation of a water quality surveillance program to ensure that supplied water meets the drinking water standards;
(vi) Using low-noise and energy efficient pumping systems;
(vii) Installing low noise-producing pumps and motors etc., in enclosed buildings with noise reducing walls, and maintaining adequate buffer to the nearby inhabited areas;
(viii) Provision of appropriate personal protection equipment to the workers and staff.

1. Water Source Sustainability

1.1 Udaipur

62. Gomati River is perineal River; sufficient water is available throughout the year. For the proposed water supply scheme at Udaipur water demand for the projected year 2038 is 12.05 and for 2053 is 16.30. Present generation of surface and ground water is – 4.29 MLD and 1.57 MLD, i.e total 5.86. Without considering ground water in future total requirement of surface (River water) in projected year will be around 12.01 MLD.

63. The Gomati Rivers flows predominantly towards west and as per the local information, flow in river varies seasonally, and it carries high flows during the monsoon and post monsoon, and very low flows during the winters lean months, and medium flows in the in between months., Flow is able to meet demand for most part of the year and during peak winters if the flow is insufficient to provide adequate water, gap in supply is being met by groundwater. Quality of water is suitable for drinking after conventional treatment.

64. Water Resource Investigation Division has allowed the withdrawal of 0.573 MCM/ 19.1 MLD of river water for drinking purpose for Udaipur town. It shows that quantum of water required for the proposed project is secured. It has been found that in between the months of October and April there is a deficit of water availability in the Gomati River. During that period maximum and minimum runoff is 1.55MCM/ 51.7 MLD and 187.89 MCM/6255 MLD. Surface/ River water demand for the proposed subproject in Udaipur is only 19.1 MLD, less than the available runoff in river throughout the deficient period. Hence the availability of surface water from river Gomati is secured.

65. Water Resources Investigation Division (WRID), Agartala has provided a final water withdrawal permission letter on the basis of water availability in the Manu, Juri and Gomoti River (Vide memo no. F.1(40)/EE/WRID/TECH/2021/3007-09 Dated: 08.02.2023). The detailed analyses table based on water runoff, water availability and withdrawal and water allocation letter are attached in Error! Reference source not found..

1.2 Bishramganj

66. The proposed project is to augment and improve the water supply system Bishramganj Village Panchayat using deep tube wells as water source. Bishramganj is a newly constituted Village Panchayat comprising of 3 Gram Panchayats namely Bishramganj, Barjala and Chesrimai which accommodates a total population of 12864 no. for the year 2023. The present water supply to the town is from the 9 nos (2.14 MLD). Of existing DTWs..

67. Water supply at Bishramganj town is through piped system using ground water. The existing water source is not capable to cater the required amount of water. Hence additional deep tube wells have been proposed with IRP.

68. An approval letter Vide memo no. F.1(40)/EE/WRID/TECH/2020/58-60 has been provided by Water Resources Investigation Division, Agartala where they have provided a ground water potential map for the state of Tripura where area wise yield has been marked. 6 new tube wells (which already sunk) and existing DTWs will be utilized to fulfill this demand gap. The document is attached in **Appendix 13.**

69. While proposing the tube wells the specified yield provided in the map has been taken into consideration. The available ground water yield of Bishramganj town ranges from 50 m^3/hr to 100 m^3/hr. Therefore, it is proposed that the new tube wells may withdraw water considering sustainable discharge with 60% safety.

70. The proposed system is pumping system therefore three numbers of OHSR has been proposed to make possible to run the pump at uniform rate. The provision of reservoir will result in an overall reduction in size of pump & pipes and helps in maintain the constant pressure in distribution mains. The filtered water (after passing through IRP) will be stored in the overhead reservoir and finally distributed to consumers by gravity. The reservoir shall be designed for 15 years design period with 300 KL OHSR, 200 KL OHSR and 250 KL OHSR capacity by considering the 12 hrs. water demand for the projected year 2038.

71. As per presented above, in terms of water availability and quality of water, selected source is adequate and suitable to meet the project water demand, and there are unlikely to be any issues related source sustainability during the project life cycle.

1.3 Belonia

72. The proposed project is to augment and improve the water supply system Belonia using deep tube wells as water source. Belonia is a small town which accommodates a total population of 22876 no. for the year 2023. The present water supply to the town is from the Muhuri river and 5 Deep Tube wells. To support the requirement 5 new deep tube wells have been proposed. Total production capacity of those 5 tube wells will be 3.56 MLD. In addition, intake and WTP of 4.54 MLD is available for future use. The existing water treatment plant is not capable to cater the required amount of water. Hence additional deep tube wells have been proposed with IRP.

73. An approval letter Vide memo no. F.1(40)/EE/WRID/TECH/2020/58-60 has been provided by Water resources Investigation Division, Agartala where they have provided a ground water potential map for the state of Tripura where area wise yield has been marked. 5 new tube wells are proposed to fulfill this demand gap. The document is attached in **Appendix 13.**

74. While proposing the tube wells the specified yield provided in the map has been taken

into consideration. The available ground water yield of Belonia town ranges from 50-100 m³/hr. Therefore, it is proposed that the new tube wells may withdraw water considering sustainable discharge with 50% safety.

75. The proposed system is pumping system therefore two numbers of OHSR has been proposed to make possible to run the pump at uniform rate. The provision of reservoir will result in an overall reduction in size of pump & pipes and helps in maintain the constant pressure in distribution mains. The filtered water (after passing through IRP) will be stored in the overhead reservoir and finally distributed to consumers by gravity. The reservoir shall be designed for 15 years design period with 300 KL (OHSR-1) and 400 KL (OHSR-2) capacity by considering the 12 hrs. water demand for the projected year 2038.

76. As per presented above, in terms of water availability and quality of water, selected source is adequate and suitable to meet the project water demand, and there are unlikely to be any issues related source sustainability during the project life cycle.

77. **Design Period:** The design period adopted for the Water Supply system is 30 years for mechanical component, and 15 years for OHSR and distribution system.

2. Environmental Audit of Existing Infrastructure

78. It is designed to utilize existing water supply infrastructure like WTP (at Udaipur, Amarpur, Melaghat and Belonia), clear water reservoirs, pump houses etc. with necessary improvements. As per the ADB SPS 2009, these are associated facilities and therefore the component operation shall comply with the ADB and applicable environmental laws of India. Besides, ADB SPS lays emphasis on impacts and risks on biodiversity and natural resources, pollution prevention abatement including hazardous waste, occupational health and safety, community health and safety, and physical cultural resources. A primary environmental audit is conducted to (i) assess the compliance of the existing infrastructure with environmental legislations and (ii) improve environmental performance to minimize future potential liabilities. Detailed shall be carried out during detailed design stage (to be done by DBO contractor).

79. All the existing infrastructure facilities are in urban areas within towns. There are no environmentally sensitive or protected areas in or near the vicinity of the sites. **Table 25** below shows summary of audit for existing components that will be used in new water supply scheme. **Appendix 6** shows preliminary environment audit of existing WTPs at Udaipur, Amarpur, Melaghat and Belonia

Table 25: Environmental Audit of Existing water supply components

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
Udaipur				
5.9 MLD WTP	Existing WTP of capacity 5.9 MLD (production of water 4.72 MLD, 80% of the total	No Change in existing WTP A new WTP of 7.6 MLD has been proposed within the WTP Campus.	CTE and CTO are not required in for WTP in Tripura	WTP has Backwash Tank but it is not fully functional. Sludge from WTP is dewatered, store within campus for a short period and finally utilize/ dispose

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
	capacity) on Gomati River.			at designated place after getting NOC from concerned authority. Needs improvement to prevent discharge of partial backwash water, and also in sludge handling
	Treated water quality	-	Yes – with drinking water standards (IS 10500-2012)	Only few parameters are tested –. All parameters are within acceptable limit.
Intake well cum raw water pumping station	• VT Pump of 50 HP Capacity each: 3 nos. • Pump Type: Vertical turbine centrifugal pump	No rehabilitation work required and performance is satisfactory as per DWS and UMC In addition, as per requirement new intake of 12 MLD will be constructed on River Gomati	No requirements under existing laws	Occupational health and safety, public safety during the construction works Disposal of discarded material, waste oils, mechanical and electrical parts.
Transmission and distribution	The exisiting clear water transmission main was analysed and found hydraulically sufficient based on the assumed pipe alignment and diameter. The total length of the distribution network is about 80 km	• Replacement: new pipes will be laid in the place of existing pipes • Pipes will be left as it is in the ground, no rehabilitation / removal proposed	No requirements under existing laws	Data and information on exact alignment and diameter of pipes are not available with DWS. Accidental disturbance / need to remove in narrow roads Occupational health and safety, public safety during trenching
Amarpur				
2.95 MLD WTP	Existing WTP of capacity 2.95 MLD on Gomati River.	No Change in existing WTP Water from WTP will be utilized	CTE and CTO are not required in for WTP in Tripura	WTP has Backwash Tank of 100 m² but it is not fully functional. Sludge from WTP is dewatered, store within campus for a short period and finally utilize/ dispose at designated place after getting NOC from concerned authority.
	Treated water	-	Yes – with drinking	Only few parameters are

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
	quality		water standards (IS 10500-2012)	tested – residual chlorine is slightly on higher side but within allowable limits.
Intake well cum raw water pumping station	• Pump Capacity: 50HP VT Pump= 2no, 50HP Centrifugal pump= 1 no • Pump Type: Vertical turbine centrifugal pump	• No rehabilitation work required and performance is satisfactory as per DWS and AMC	No requirements under existing laws	Disposal of discarded material, waste oils, mechanical and electrical parts.
Transmission and distribution	The total length of the distribution network is about 27.52 km	• Replacement; new pipes will be laid in the place of existing pipes • Old Pipes will be left as it is in the ground, no rehabilitation / removal proposed	No requirements under existing laws	Data and information on exact alignment and diameter of pipes are not fully available with DWS Accidental disturbance / need to remove in narrow roads Occupational health and safety, public safety during trenching
Bishramganj				
Deep tube well and Iron removal plant	There are 9 nos. deep Tube Wells, out of which new 4 IRPs, but due to lack of maintenance, existing packaged Iron removal plants are not functioning	• Since ground water source will be utilized repairing of IRPs are required from DWS	No requirements under existing laws	Iron sludge will be disposed at designated place after getting NOC from concerned authority
Melaghar				
4.77 MLD WTP	Existing WTP of capacity 4.77 MLD	No Change in existing WTP Water from WTP will be utilized	CTE and CTO are not required in for WTP in Tripura	WTP has Backwash Tank of 150 m^2 but it is not fully functional. Sludge from WTP is dewatered, store within campus for a short period and finally utilize/ dispose at low lying area and dry sludge used in road construction.

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
				• Chemical storage in WTP is not properly maintained and Alum and bleaching powder are laying on floor without any secondary containments. • The sludge from WTP is dumped at WTP low laying area of WTP • Waste from Dewatering is disposed in downstream of intake in river • Electric panels were seen without safety rubber mats
	Treated water quality	-	Yes – with drinking water standards (IS 10500-2012)	Only few parameters are tested – residual chlorine is slightly on higher side but within allowable limits.
Intake well cum raw water pumping station	• Pump Capacity: 3 nos. @ 60000 GPH/ 272.8 cum/hr each Pump Type: Vertical turbine centrifugal pump	No rehabilitation work required and performance is satisfactory as per DWS and ULB	No requirements under existing laws	Occupational health and safety, public safety during the construction works Disposal of discarded material, waste oils, mechanical and electrical parts.
Transmission and distribution	• The exisiting clear water transmission main was analysed and found hydraulically sufficient based on the assumed pipe alignment and diameter. • The total length of the distribution network is about 36.56	• Replacement; new pipes will be laid in the place of existing pipes • Pipes will be left as it is in the ground, no rehabilitation / removal proposed	No requirements under existing laws	Data and information on exact alignment and diameter of pipes are not fully available with DWS Accidental disturbance / need to remove in narrow roads Occupational health and safety, public safety during trenching

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
	km			
Belonia				
4.54 MLD WTP	Existing WTP of capacity 4.54 MLD on Muhuri River.	No Change in existing WTP Water from WTP will be utilized	CTE and CTO are not required in for WTP in Tripura	WTP has Backwash Tank of 150 m² but it is not fully functional. Sludge from WTP is dewatered, store within campus for a short period and finally utilize/ dispose at designated place after getting NOC from concerned authority.
	Treated water quality	-	Yes – with drinking water standards (IS 10500-2012)	Only few parameters are tested – residual chlorine is slightly on higher side but within allowable limits.
Intake well cum raw water pumping station	• Pump Capacity: VT Pump of 75 HP Capacity each: 2 nos. • VT Pump of 60 HP Capacity each: 2 nos. • Pump Type: Vertical turbine centrifugal pump	No rehabilitation work required and performance is satisfactory as per DWS and AMC	No requirements under existing laws	Occupational health and safety, public safety during the construction works Disposal of discarded material, waste oils, mechanical and electrical parts.
Transmission and distribution	• The exisiting raw and clear water transmission main was analysed and found hydraulically sufficient based on the assumed pipe alignment and diameter. • The total	• Replacement; new pipes will be laid in the place of existing pipes • Pipes will be left as it is in the ground, no rehabilitation / removal proposed	No requirements under existing laws	Data and information on exact alignment and diameter of pipes are not available fully with DWS Accidental disturbance / need to remove in narrow roads Occupational health and safety, public safety during trenching

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
	length of the distribution network is about 23.8 km			

80. The environmental concerns are mainly related to occupational health and safety, oils, fuels and chemical handlings, waste management etc. wastewater (backwash and clarifier water) and sludge management systems of WTP are not functional properly, it needs upgradation. No new works are proposed in existing WTP.

81. The DBO contractor will conduct technical assessment WTP during the detailed design phase including quality of treated water, backwash and sludge handling system, chemical handling etc., and prepare a service improvement plan and based on the requirement the Department of water supply (DWS) will upgrade these systems as required and report to PMU, PMU will ensure that necessary corrective actions are taken.

82. **Energy Efficiency**. To optimize the power consumption, the hydraulic design shall follow optimal approach, and the following shall also be considered in design and selection of pumping systems. According to Manual for the Development of Municipal Energy Efficiency Projects in India (jointly developed by Bureau of Energy Efficiency (BEE) and International Finance Corporation in 2008), energy savings, at minimum, of 25% to 40% is possible with appropriate measures. The following measures shall be considered and incorporated into the subproject designs:

(i) Installation of Energy Efficient Motors;
(ii) Efficient Pumping system operation.
(iii) Installation of Variable Frequency Drives (VFDs).

83. **Wastewater and Sludge from Water Treatment Plant - treatment and disposal**. Effective sludge disposal system will be made within the proposed WTPs. The process wastewater will be generated from the following WTP units, and the same will be conveyed to a sump from where the clarified water will be pumped back to inlet. There will be no wastewater release from the WTP, and the settled sludge will be further processed. DBO contractor will develop final sludge management plan.

84. Sludge will be generated from the following units of treatment process.

(i) Filter backwash.
(ii) Flocculator and Clarifier- Plate settler.
(iii) The backwash water from filter contains intestinal, parasitic worms and pathogenic microorganisms.

85. Sludge from plate settler contains higher concentration of polyelectrolyte, salts of alumina and ferric which is required to be removed prior to disposal and thus sludge treatment process is proposed.

86. Common sludge storage is considered for both plate settler clarifier and rapid sand gravity filter. Common sludge lines from other units of the plant are also proposed to be connected to this sludge storage tank.

87. Consistency of sludge generated from clarifier considered -1%.

88. Recycle of used wash water from filters (will be generated within the backwash period, considered to be 7 minutes/ filter for 4 filters i.e., 70 minutes)- 1500 m^3/day.

- Volume of clarifier sludge generation- 1.85 m^3/h
- Storage volume considered -1 h
- Volume of clarified water -660 m^3
- Volume of sludge well -750 m^3

89. The sludge valve from plate settler shall be motorized knife gate valve with timer operation (duration & interval). The timers will be set by operator depending upon the raw water quality (mainly turbidity & suspended solids). The sludge will be collected in a sludge sump. The sludge will be pumped by means of positive displacement pumps (screw pumps) to centrifuge sludge thickener. Before entering the centrifuge, polyelectrolyte will be dosed into the sludge. Polyelectrolyte dosing system with solution tank and dosing pumps shall be housed in centrifuge/ sludge handling system building. The concentrate will be recycled to inlet of treatment plant.

90. The backwash wastewater from filters shall be collected in the sump and shall be pumped back to cascade aerator of the WTP.

91. Dried sludge will be used as soil conditioner. Periodic testing of dried sludge will be conducted to ensure that it does not contain heavy metals that make it unsuitable for food crops. Tests will be conduct to confirm the concentrations below the following standards. As there are no specific standards notified for sludge reuse, the compost quality standards notified under the Municipal Solid Waste Management and Handling Rules, 2000, 2016 have been adopted here. The MSWMH Rules stipulate that “In order to ensure safe application of compost, the following specifications for compost quality shall be met”, namely:

Parameters Concentration Not to Exceed[a] (mg/kg dry basis, except pH value and C/N ratio)	
Arsenic	10.00
Cadmium	5.00
Chromium	50.00
Copper	300.00
Lead	100.00
Mercury	0.15
Nickel	50.00
Zinc	1000.00
C/N ratio	20-40
pH	5.5-8.5
[a]Compost (final product) exceeding the above stated concentration limits shall not be used for food crops. However, it may be utilized for purposes other than growing food crops.	

92. **Tree Cutting at Selected Project Sites**. At Udaipur the identified intake well support structure (electric substation, guard room etc.) and at other location like Belonia DTW & OHSR site has few trees, mostly commercial rubber plantation. Preliminary estimate indicates that around 29 trees (10 trees at Udaipur intake, Belonia about 18 at 2 DTW site and one OHSR

with DTW site) need to be felled but final number will be depending on final design of DBO contractor. Following measures need to be implemented to compensate for the loss of any tree cover.

- Minimize removal of trees by adopting to site condition and with appropriate layout design;
- Obtain prior permission for tree cutting;
- Plant and maintain 5 trees for each tree that is removed.

93. **Structure in seismic zone V- Design impact & mitigation**: While a structure is designed all possible load combination are considered those may come into structure. This includes seismic load also. In zone V the ground vibration is maximum. Corresponding to this the Peak Ground Acceleration (PGA) is provided in the relevant code for seismic design (Indian Standard, IS 1893: 2002, 2016). As per this PGA and the seismic acceleration response curve is given in the code and other factors like Response Reduction Factor and Importance Factor as per the same code the seismic analysis is done and structures are designed accordingly. As the ground acceleration is maximum in zone V, the cost of the structure also becomes high for provision of higher reinforcement etc. As per the seismic design philosophy laid in IS: 1893-2002 and 2016, the structure is designed such a way that it can withstand all Design Basis Earthquake (DBE) which are basically minor and medium ground shaking, and it should not collapse but have cracks which are reparable during Maximum Considered Earthquake (MCE) which are basically major slaking. Thus, as per the provision of the seismic code the structure is designed in such a way that in no case it will collapse. The present structures are also designed in line with the above provision of the IS 1893. For trench excavation or for foundations, no hard rock cutting / removal is required.

94. **Project locations close to protected monuments in Udaipur and close to Rudrasagar Ramsar Wetland in Melaghar.** These protected areas are located within the urban areas of Udaipur and Melaghar, are surrounded by residential areas. Both the ASI monuments (temples) are in the eastern part of the Udaipur town, within urban area. There are no components located in or close to these places. Except proposed water distribution lines to serve the residential areas around these sites, none of the components like Intake, WTP and overhead tanks are located within 500 m of these. Nearest pipeline (110-160 mm diameter) to the outer boundary of Gunavati temple (ASI monument) is 38 m, and to Chaturdasha devta temple (ASI monument) is 57 m. In Melaghar, the nearest pipeline (90 mm diameter) proposed is about 50 m from the boundary of the Rudrasagar wetland. Proposed pipelines will be buried underground (1 m below the ground). The width of trench to be excavated to be about 300-400 mm wide and 1 m deep. No impacts envisaged due to location of these pipes. There may be temporary impacts during construction, however given small scale works and that sensitive areas and sites are separated by existing houses, the impacts are likely to be not significant. The general construction measures to control noise, dust, contaminated / silt laden runoff, minimizing inconvenience to visitors etc., will be required.

- During the detailed design, PIU to consult ASI (in Udaipur / Agartala) with exact distance and depth of waterlines works within 300 m of the monuments, and include any feedback or measures as suggested by ASI in design/construction; obtain prior ASI permission for construction if required
- Prior to commencement of construction, consult with concerned religious authorities of these temples, nearby people and devotees and explain the work method and duration of proposed works, take their suggestions and comments in scheduling and conducting the works

- Prevent dust, noise, accumulated of water, and contaminated surface runoff from the work sites; take necessary measures as needed (these are presented in construction phase impacts-measures)
- No construction camps (workers accommodation, material / waste / soil storage) should be established within 500 m of the monuments in Udaipur
- No construction camps (workers accommodation, material / waste / soil storage) should be established within 1000 m (1 km) from the boundary of Rudrasagar lake; camps should not be located close to drainage lines/streams that flow into Rudrasagar lake
- All project related site staff, construction workers and supervisors, shall be made aware of the sensitive sites, and prevent any harm or damage or disturbance to trees, vegetation, wildlife, birds etc.,
- Proper accommodation and facilities shall be provided within the camps, and workers shall not use the lake or surroundings for open defecation, bathing, or fishing / hunting, collecting firewood etc. Contractor should put in place, a proper system to monitor the staff and workers to prevent damage/ disturbance.
- Do not use equipment that generate heavy noise, ground vibration, dust etc., (such as pneumatic drills, dozers etc., within 100 m of temples, or within 500 m of Rudrasagar lake)
- Schedule works during dry season to avoid contaminated runoff from the work sites entering lake; clear the sites of materials, debris, and consolidated the refilled trenches prior to onset of monsoon
- Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
- Place storage areas for fuels and lubricants away from any drainage leading to water bodies;
- Store fuel, construction chemicals etc., on an impervious floor, also avoid spillage by careful handling
- Dispose any wastes generated by construction activities in designated sites; and
- Conduct surface quality inspection according to the environmental management plan (EMP).
- Conduct continuous consultations with the local people during the works

95. **Chance finds.** For this project, excavation will occur at locations not known to have archaeological values. Except in Udaipur, there are no notable monuments or places of archeological interest nearby the project areas. In Udaipur town, works proposed close to ASI monuments are for laying pipelines, and excavation will be limited to 1-1.2 m only. Although limited, risk of uncovering archaeological remains during the excavations cannot be ruled out completely in project towns. DBO Contractors therefore should follow the below measures in conducting any excavation work:

(i) Create awareness among the workers, supervisors and engineers about the chance finds during excavation work;
(ii) Stop work immediately to allow further investigation if any finds are suspected;
(iii) Inform local Archaeological Department if a find is suspected and take any action, they require to ensure its removal or protection in situ; and prepare a chance find protocol

96. **Selection of site for DTW 3 at Belonia :** There is a septic tank close to the proposed site for DTW in Balonia. Large parcel of land available at the site is owned by Belonia MC. Although considering the depth of DTW, will be 200 m and strainer at 160 m, the risk of

contamination is limited, however, it is important that the risk of contamination is eliminated. Following measures shall be implemented during the finalization of tube well site during detailed design:

- Ensure a minimum of 30 m distance from septic tank / its discharge point. If land available, this distance can be increased to 50 m
- The borewell and septic tank should be on the opposite corners and preferably diagonally opposite to each other with sufficient distance.
- Testing of ground water quality from nearby tube well will be done before start of drilling for DTW. After development period water samples from new deep tube well will be collected for analyzing chemical and biological parameters.

97. **Design Period.** The design period adopted for the Water Supply system is 30 years for pumping main and distribution system and 15 years for pumping machinery and OHSRs.

C. Pre-construction Impacts

98. **Utilities.** Telephone lines and wires, water lines within the proposed subproject locations may require to be shifted in few cases. Mitigation of adverse impacts due to relocation of the utilities, contractor will (i) identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; (ii) provide prior notice (at least one week in advance) to affected areas and (iii) require DBO contractors to prepare and implement a contingency plan to include actions to be done in case of unintentional interruption of services.

99. **Site selection for equipment lay-down and storage area**. Improper selection will affect local environment and inconvenience public. Priority is to locate these near the subproject locations. However, if it is deemed necessary to locate elsewhere, sites to be considered will not promote instability and result in destruction of property, vegetation and drinking water supply systems. Residential areas are not considered for setting up camps to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). Disposal sites shall not be located near water bodies or in areas which are inconvenience the community. Following mitigation measures are to be implemented:

- Choice of location for equipment lay-down and storage areas must take into account distances to adjacent land uses, general onsite topography and water erosion potential of the soil. Impervious surfaces must be provided where necessary.
- Storage areas shall be secure to minimize the risk of crime. They shall also be safe from access by children or animals etc.
- Residents living adjacent to the construction site must be notified of the existence of the hazardous storage area.
- Equipment lay-down and storage areas must be designated, demarcated, and fenced if necessary.
- Fire prevention facilities must be present at all storage facilities.
- Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the temporary storage areas.

- These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources.
- Fuel tanks must meet relevant specifications and be elevated so that leaks may be easily detected.
- Staff dealing with these materials or substances must be aware of their potential impacts and follow the appropriate safety measures.

100. **Sources of Materials**. Since the construction work is not heavy, moderate amount of sand and coarse aggregate will be required for this sub-project, which will be sourced from quarries. Quarries inevitably cause few physical changes; as construction materials are excavated from the ground, leaving large cavities, or levelling hillsides, etc. The physical damage caused by quarries is controlled by allowing them to operate within specific limited areas only, so the damage is restricted in extent and not allowed to spread indiscriminately. Contractor should avoid new borrow pits/quarries as far as possible, if necessary, all the permissions, including conduct of environmental assessment, and environmental clearance as necessary shall be obtained prior to start of quarrying activity. The contractor should also make a concerted effort to re-use as much excavated material from this sub-project as possible. It is the DBO Contractor's responsibility to verify the suitability of all material sources and to obtain the approvals prior to procurement of material. The DBO Contractor will be required to:

(i) Obtain construction materials only from government approved quarries with prior approval of cluster-PIU;
(ii) Cluster-PIU to review, and ensure that proposed quarry sources have all necessary clearances/ permissions in place prior to approval;
(iii) Contractor to submit to Cluster-PIU on a monthly basis documentation on material obtained from each source (quarry/ borrow pit);
(iv) Avoid creation of new borrow areas, quarries etc., for the project; if unavoidable, contractor to obtain all clearances and permissions as required under law, including Environmental Clearance prior to approval by cluster-PIU.

101. **Maintaining Core Labor Standard**. The Contractor and PMU/PIU are responsible for ensuring that international CLS[11] as reflected in national labor laws and regulations are adhered to. PIU is ultimately responsible for monitoring compliance with national labor laws and regulations, provided that these national laws are consistent with CLS. ADB will carry out due diligence – during loan review missions - to ensure that executing and implementing agencies and contractors comply with applicable (national) core labor standards and labor laws. PMU or PIU will ensure that bidding and contract documents include specific provisions requiring contractors to comply with all: (i) applicable labor laws and core labor standards on: (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity or caste; and (c) elimination of forced labor; and (ii) the requirement to disseminate information on sexually transmitted diseases including HIV/AIDS to employees and local communities surrounding the project sites. These will be monitored as part of the project's safeguards reporting requirements.

[11] Core Labor Standards (CLSs) are a set of four internationally recognized basic rights and principles at work: (i) freedom of association and the right to collective bargaining; (ii) elimination of all forms of forced or compulsory labor; (iii) effective abolition of child labor; and (iv) elimination of discrimination in respect of employment and occupation.

D. Construction Impacts

1. Construction of river intakes – Udaipur

102. Construction of intake well in the river may lead to degradation of water quality due to increase in turbidity and chemical contamination from fuels and lubricant used in construction work. Increase in silt content and water turbidity, chemical quality can affect the aquatic life. Though there are no notable aquatic life, to ensure that any negative impacts are mitigation, the contractor will be required to:

- Select a construction methodology that is least disturbing, and appropriate for the in-situ soil condition.
- Schedule the construction works during low water level period –(November - February); ensure that works are completed during the same period to prior to onset of monsoon; confirm with concerning authorities on release of water; avoid scheduling the works during water release period.
- Erect temporary barriers to form enclosed construction area with least disturbance
- Avoid/minimize use of fuels, chemicals, and lubricants; ensure no spillage

2. Construction methodology of production tube well – at Belonia

- Drilling work of pilot hole is to be taken up and completed up to recommend depth at respective point
- After the completion of pilot hole drilling, it is to be electrically logged, in order to identify the promising aquifers for screening it. Based on the physical observation of formation material (drill cuttings) and the Electro logging Test Results, corrected lithological log is to be prepared for recommending lowering of well pipe Assembly. Based on the study of Mechanical Analysis of Aquifer material for grain size distribution, the slot size & gravel size should be selected and recommended.
- On confirmation of well pipe Assembly, Pilot hole is to be reamed (enlarged) to 500 mm diameter for lowering 250 mm pipe diameter or hole diameter of 600 mm for lowering 300 mm pipe diameter, as the case may be, up to the total recommended depth of tube well.
- On lowering the pipe assembly into the enlarged hole, space between the (slotted & blank) pipe and enlarged hole should be packed with proper size gravel from the bottom of well up to the bottom of clay packing below ground level.
- From the top of the gravel packing, up to the ground level, perfect clay packing between Pipe and Hole is to be provided, for sanitary as well as water quality protection of well.
- Well, is to be developed through backwashing prior to compressor development test.
- Production tube well is to be developed using Airline pipe by using appropriate capacity of compressor for getting sand free discharge (or Well is to be developed at least for 40 to 50 hours whichever is less). Water samples should be collected for analyzing chemical and biological parameters.
- Production tube well is to be developed (10 to 15 hours depending on the observation of sand free discharge it is indicative) through over pumping before conducting Pump Test. Thereafter Pump Test is to be conducted for yield test (5-to-6-hour continuous pumping) to recommend appropriate size & capacity of pump

to be installed before putting the well. Water samples should be collected for analyzing chemical and biological parameters.

103. Beside DTW or OHSR Iron Removal Plant (IRP) will be installed. The Iron Removal Filters are designed to remove the Excess Iron content present in the feed water with minimum pressure drop. Most iron filtration systems operate on the principal of oxidizing the iron (oxidation) to convert it from a ferrous (dissolved or soluble) to a ferric or undissolved state. Iron removal plants can be based on different filtration media, depending on the iron and manganese concentration, the oxygen level, CO_2 content and hardness of the water. As per the certification of CSIR-IMMT Bhubaneswar that Iron Removal Plant (IRP) of Resin based ion exchange technology is capable to remove high Iron contented ground water of DTW to acceptable limit as per BIS standard. Therefore, it is proposed to install resin-based Iron Removal Plant for Belonia MC (5 nos.) and Bishramganj MC (3 nos.). The plant should be capable of treating water from maximum level of contamination 10.00 ppm for iron in raw water of DTWs bored at different sites up to 0.3 ppm and be able to purify in the specified standards for Iron, Manganese & Bacteriological contamination as per BIS standard.

104. Other civil works in the subproject include Intake, WTP an CWR (at Udaipur) OHSRs pump room, guard room and laying of pipes etc. at the identified sites. Open cut trenching method of pipe laying involves excavation for laying pipes along the roads, placing pipes in the trench, jointing, and testing, and refilling with the excavated soil. Pipes are normally placed by approx. 1 to 1.2 m below the existing ground level or road level and a clearance of 200 mm is left between the pipe and each side of the trench to allow backfilling. Trenches will be around 1 – 1.2 m deep and 400-800 mm wide. As trenches are only 1-1.2 m deep, there risk of collapse of trenches or damage to surrounding buildings is minimal. However, necessary precautions are being taken depending on the soil conditions, and if required measures such as bracing or shoring in the trench will be provided. Once they are laid, pipes will be joined as per specification and then tested for any cracks of leakages. About 85%-95% of the excavated soil will be used for refilling the trench after placing the pipe and the residual soil of 5-15% will be disposed of. Therefore, residual soil after pipe laying and refilling is not significant.

105. Although pipe laying work involves quite simple techniques of civil work, the invasive nature of excavation and pipeline alignment in the built-up areas of towns where there are a variety of human activities, will result in impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. Anticipated impacts during the construction phase are discussed below along with appropriate mitigation measures to avoid, minimize, or mitigate those impacts to acceptable levels.

106. **Air Quality**. Construction work, especially from earthwork activities, material and debris transport, and works along the public roads carrying significant traffic, have high potential to generate dust. Also, emissions from construction vehicles, equipment, and machinery used for excavation and construction induce impacts on the air quality. Anticipated impacts include dust and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons. Dust generation from construction work in individual and confined work sites like intake, WTP and OHSRs etc., are mainly during the initial construction phase of earth work, as the site is confined, dust can be effectively controlled with common measures. Dust generation will be significant during pipeline laying along the roads. Increase in dust/ particulate matter in ambient air is detrimental and may have adverse impacts on people and environment. To mitigate the impacts, DBO contractors are required to:

3. For all construction works

- Provide a dust screen around the construction sites at intake, WTP, IRP and DTW and OHSRs work sites. Extra protection is required near sensitive receptors like school, Anganwadi, religious places located nearby the construction site.
- Damp down the soil and any stockpiled material on site by water sprinkling;
- Use tarpaulins to cover the loose material (soil, sand, aggregate etc.,) when transported by trucks;
- Clean wheels and undercarriage of haul trucks prior to leaving construction site/quarry;
- Control dust generation while unloading the loose material (particularly aggregate, soil) at the site by sprinkling water and unloading inside the barricaded area;
- Stabilize surface soils where loaders, support equipment and vehicles will operate by using water and maintain surface soils in a stabilized condition
- Apply water and maintain soils in a visible damp or crusted condition for temporary stabilization;
- Apply water prior to levelling or any other earth moving activity to keep the soil moist throughout the process;
- Cover the soil stocked at the sites with tarpaulins;
- Control access to work area, prevent unnecessary movement of vehicle, public trespassing into work areas; limiting soil disturbance will minimize dust generation
- Ensure that all the construction equipment and machineries are fitted with pollution control devises, which are operating correctly, and have a valid pollution under control (PUC) certificate.

4. For pipeline works

- Barricade the construction area using caution tape and hard barricading.
- Initiate site clearance and excavation work only after barricading of the site is done;
- Confine all the material, excavated soil, debris, equipment, machinery (excavators, cranes etc.,), to the barricaded/demarcated area;
- Limit the stocking of excavated material at the site; remove the excess soil from the site immediately to the designated disposal area;
- Carry out work in night time at the places having sensitive receptor for less disturbance of traffic activity.
- Undertake the work section wise: 100 – 200 m section should be demarcated and barricaded;
- Conduct work sequentially - excavation, pipe laying, backfilling; conduct pipe testing section-wise (for a minimum length as possible) so that backfilling, stabilization of soil can be done;
- Tree cutting must be avoided and if un-avoidable then 1:5 ratio for plantation must be maintained with proper channels.
- Remove the excavated soil of first section to the disposal site; as the work progresses, sequentially, by the time second section is excavated, the first section will be ready for backfilling, use the freshly excavated soil for backfilling, this will avoid stocking of material, and minimize the dust;
- Water bodies must not be disturbed, for passing pipeline
- Backfilled trench at any completed section after removal of barricading will be the main source of dust pollution. The traffic, pedestrian movement and wind will generate dust from backfilled section. Road restoration shall be undertaken immediately.

107. **Noise and Vibration Levels**. WTP. Intake, OHSR, IRP and DTW site are in isolated areas, and pipeline networks are located predominantly in a rapidly developing urban area. Pipeline sites are located close to habitation areas, where there are houses, religious places and businesses. The sensitive receptors are the general population in these areas. Increase in noise level may be caused by excavation, particularly breaking of cement concrete or bitumen roads for laying of pipeline, operation of construction equipment like concrete mixers, and the transportation of equipment, materials, and people. Vibration generated from construction activity will have impact on nearby buildings. This impact is negative but short-term, and reversible by mitigation measures. The DBO Contractor will be required to:

- Plan activities in consultation with Cluster-PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;
- Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimize sound impact to surrounding sensitive receptor like school, religious places;
- Noise level should be controlled and below the standard near ASI protected areas and no construction will be allowed at night near the protected areas.
- Maintain maximum sound levels not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s;
- Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach;
- Near school, Anganwadi, religious places and health center work need to be completed in shorter period. Noise generation should be restricted near the above sensitive receptors. Work should be carried out during day time only and non-school hours.
- Consult local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals.

108. **Surface Water Quality**. Run-off from stockpiled materials and chemicals from fuels and lubricants during construction works can contaminate downstream surface water quality of the streams. It is important that runoff from the construction areas, which may contain silt and chemical traces do not enter these water bodies. Impact will be temporary, and may not be significant, but needs to be mitigated. DBO contractor will be required to:

- All earthworks be conducted during the dry season to prevent the problem of soil run-off during monsoon season;
- Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
- Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, only designated disposal areas shall be used;
- Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
- Place storage areas for fuels and lubricants away from any drainage leading to water bodies;
- Store fuel, construction chemicals etc., on an impervious floor, also avoid spillage by careful handling
- Dispose any wastes generated by construction activities in designated sites; and
- Conduct surface quality inspection according to the environmental management plan (EMP).

109. **Pollution of River water during construction.** Construction of intake well in the river and construction of pipe-supporting bridge may lead to degradation of water quality due to increase in turbidity and chemical contamination from fuels and lubricants used in construction work. Increase in silt content and water turbidity, chemical quality can affect the aquatic life, silting/chocking of spill ways/ canals etc. Though the work is small scale, to ensure that any negative impacts are mitigated, the contractor is required to:

- Select a construction methodology that is least disturbing, and appropriate for the in-situ soil condition, and able to complete the construction work in minimum time
- Schedule the construction works during low flow period and ensure that works are completed during the same period to prior to onset of monsoon
- Erect temporary barriers to form enclosed construction area with least disturbance
- Allow adequate time settle the distributed solids to prior to pumping out water; only clear/clarified water shall be pumped back into the water body/reservoir; any silt laden water should be pumped to a silt pond
- Avoid/minimize use of fuels, chemicals and lubricants; ensure no spillage; and have an equipment spill and containment plan and appropriate materials on-site
- Clean up the site after construction; excavated soil, debris, material shall be cleared from the river bed/bank properly
- Conduct water quality inspection according to the Environmental Monitoring Plan (EMP)

110. **Construction Activity Near Rudrasagar Lake at Melaghar town.** In Melaghar, the nearest pipeline (90 mm diameter) proposed is about 50 m from the boundary of the Rudrasagar wetland. Proposed pipelines will be buried underground (1 m below the ground). The width of trench to be excavated to be about 300-400 mm wide and 1 m deep. There may be temporary impacts during construction. Works of laying pipelines are planned for households near Ramsar protected wetland. These are already developed urban area with houses. The proposed pipelines will be laid under existing roads and construction sites and wetland are separated by existing houses. Potential impacts are due to soil erosion, water pollution, noise, and dust pollution. Worker's camp should not be located near protected wetland, no storage of construction materials and equipment storage near wetland, hauling activity during day time only & construction only during dry season, and education about protecting the wetland should be provided. Ultimately, it is important to ensure that the construction is carried out in an environmentally responsible manner to minimize the impact on the ecosystem. The DBO contractor will be required to:

- Prepare SEMP before starting any work
- No construction camps (workers accommodation, material / waste / soil storage) should be established within 1000 m (1 km) from the boundary of Rudrasagar lake; camps should not be located close to drainage lines/streams that flow into Rudrasagar lake
- Movement of workers and staff should be confined to work site, and not be allowed in wetland area which may disturb the sensitive area; ensure via strict supervision no poaching, fishing, cutting / damaging trees/vegetation or wildlife, birds etc.,
- All project related site staff, construction workers and supervisors, shall be made aware of the sensitive sites, and prevent any harm or damage or disturbance to trees, vegetation, wildlife, birds etc.,
- Proper accommodation and facilities shall be provided within the camps (at least 1 km away from the wetland), and workers shall not use the lake or surroundings

for open defecation, bathing, or fishing / hunting, collecting firewood etc. Contractor should put in place, a proper system to monitor the staff and workers to prevent damage/ disturbance.

- Schedule works during dry season to avoid contaminated runoff from the work sites entering lake; clear the sites of materials, debris, and consolidated the refilled trenches prior to onset of monsoon
- Implement sediment and erosion control measures to prevent soil erosion and sedimentation in the wetland. Prevent entry of silt-laden / contaminated runoff into wetland or drains leading to wetland from the construction sites or construction camps. Appropriate measures such as silt traps, sedimentation ponds, and filtration systems should be installed to prevent sediment and other pollutants from entering the water supply. Soil stabilization measures should also be taken to prevent soil erosion during construction, Construction near wetland to be planned in dry seasons only.
- Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
- Place storage areas for fuels and lubricants away from any drainage leading to water bodies;
- Store fuel, construction chemicals etc., on an impervious floor, also avoid spillage by careful handling
- Do not use equipment that generate heavy noise, ground vibration, dust etc., (such as pneumatic drills, dozers etc.), within 500 m of Rudrasagar lake. Adapt manual excavation as far as possible
- Construction sites often generate significant amounts of dust that can impact nearby habitats. Dust suppression measures, such as watering down exposed soil, can help to reduce dust levels.
- Dispose any wastes generated by construction activities in designated sites; and
- Monitor the project closely throughout construction to ensure that all mitigation measures are being implemented effectively and that any issues are identified and addressed promptly.
- Conduct surface quality inspection according to the environmental management plan (EMP).
- Conduct continuous consultations with the local people during the works

111. **Groundwater Quality**. Another physical impact that is often associated with excavation is the effect on drainage and the local water table if groundwater and surface water collect in the voids. In the sub-project area, groundwater depth is shallow, there are few water bodies and ponds, and it also receives high rainfall during the monsoon. Conducting excavation works during non-monsoon season will certainly help, but due to high water table, water may collect in pits as they are excavated. The water collected in excavated pits will contain silt and disposal of this in drainage channels lead to silting. To avoid this the contractor needs to be implement the following measures:

- Create a temporary drainage channel around the work area to arrest the entry of runoff from upper areas into the work area
- Pump out the water collected in the pits / excavations to a temporary sedimentation pond; dispose of only clarified water into drainage channels/streams after sedimentation in the temporary ponds
- Consider safety aspects related to pit collapse due to accumulation of water

112. **Generation of Construction Wastes, Surplus Soil.** Solid wastes to be generated from

the construction activities are muck from tube well drilling excess excavated earth (spoils), riverbed earth, discarded construction materials, cement bags, wood, steel, oils, fuels and other similar items. Domestic solid wastes may also be generated from the workers' camp. Improper waste management could cause odor and vermin problems, pollution and flow obstruction of nearby watercourses and could negatively impact the landscape. The following mitigation measures to minimize impacts from waste generation shall be implemented by the contractor:

- Contractor is required to prepare plan for disposal of construction and demolition waste including excavated earth in the designated site/sites and submit the plan in PIU for approval
- As far as possible utilize the debris and excess soil, river bed earth in construction purpose, for example for raising the ground level or construction of access roads etc.;
- Avoid stockpiling any excess spoils at the site for long time. Excess excavated soils should be disposed at approved designated areas immediately, ;
- Do not store any spoil materials nearby the sensitive receptors;
- If disposal is required, the site shall be selected preferably from barren, infertile lands; site should be located away from residential areas, few water bodies and any other sensitive land uses;
- No disposal of construction wastes near 1km from protected wetland and ASI protected sites;
- During construction of tube well – waste water generate from construction activity will be channelized to pit and later muck will be collected from the pit for disposal;
- Domestic solid wastes should be properly segregated in biodegradable and non-biodegradable for collection and disposal to designated solid waste disposal site; create a compost pit at workers' camp sites for disposal of biodegradable waste; non-biodegradable / recyclable material shall be collected separately and sold in the local recycling material market;
- Residual and hazardous wastes such as oils, fuels, and lubricants shall be disposed of in disposal sites approved by TSPCB;
- Prohibit burning of construction and/or domestic waste;
- Ensure that wastes are not haphazardly thrown in and around the project site, provide proper collection bins, and create awareness to use the dust bins;
- Conduct site clearance and restoration to original condition after the completion of construction work; Cluster-PIU to ensure that site is properly restored prior to issuing of construction completion certificate.
- At soil storage site, soil should be covered by tarpaulin or regular water sprinkling should be done to reduce dust emission
- At soil disposal site the disposed soil should be levelled on daily basis and no heap or mound should be left at end of the day.

113. **Management Plan for Night works** (if required). Following requirements should be fulfilled for construction works at night hours-

- Night works should be avoided at construction sites specially in residential areas and should be performed only when day works are not possible due to excessive traffic/public/pedestrian movement, site of cultural or religious importance, where there is huge crowd during day hours or any other unavoidable circumstances.
- Limit construction activities at night. When necessary, ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures. Consult community regarding appropriate timing of noisy activities and avoid noisy activities at night. Use noise-control methods (barriers/

shelter/ muffling devices) and maintain a buffer zone if possible. Minimize project transportation, particularly heavy vehicles, through residential areas. Use of high noise generating equipment shall be stopped during night time.

- Safety gear can greatly affect worker visibility. The decision and maneuver distance – how long it takes a driver to notice the worker and make any path or speed changes – is over 5 times greater with reflective clothing than with regular, dark-colored – or even orange-colored – clothes. With this increased decision and maneuver distance, workers, motorists, and equipment are much less likely to have a collision – chances of damage, injury, or death are reduced.
- Reflective clothing isn't the only available technique to increase visibility at night. Flashing lights on a worker's body or clothing, reflective tape on equipment, and especially proper work area lighting are all good ways to increase visibility.
- Proper lighting at night includes several different levels and designations of lighting. In order to understand appropriate lighting levels for night work, we first need to talk about how it is measured. Lighting is typically measured by what are called "foot-candles". One foot-candle is the luminance cast on a 1 square foot surface by a single candle's light.
- Visibility & Training: There are two main ways to ensure that motorists and workers experience the safest possible night-time work zone. First is proper safety training, and second is improving visibility throughout the work zone and especially at critical areas like traffic control workers' stations and on any people or equipment.
- Through proper training and lighting, night time construction can happen as safely as construction in the daytime. This allows contractors and agencies to take advantage of working with fewer delays for the travelling public and for construction workers to work more safely in lower volume traffic.
- Preferably electrical connections is available for running equipment otherwise sound proof/super silent Diesel Generator set should be available
- Sound level should not increase as per following-

Type of area of work	Maximum noise level dB(A)
Industrial	70
Commercial	55
Residential	45
Silence zone	40

- Illumination should be as follows-

Minimum illumination (lx)	Areas to be illuminated	Type of work activity
54	Illumination throughout the work area	General work area lighting, and performance of visual tasks of large size, or medium contrast, or low require accuracy
108	Illumination of work area and areas adjacent to equipment	Performance of visual tasks of medium size, or low to medium contrast, or medium required accuracy
216	Illumination of task	Performance of visual tasks of small size, or low contrast or high required accuracy or fine finish

- As far as possible ready-mix concrete from batching plant to be used, otherwise the concrete should be prepared away from residential areas and brought to the site;

- All the noise activity like hammering, cutting, crushing, running of heavy equipment should be done in day time and avoided in night time;
- Workers engaged in night works should have adequate rest/sleep in day time before start of night works;
- Worker engaged for night works should have previous experience of night works and should be physically fit for such works including clear vision in night;
- All the necessary provisions of traffic aids such as traffic signals, road signage, barricades, cautions boards, traffic diversion boards etc. should be available with fluorescent/retro-reflective arrangements;
- Workers should be trained before start of night works about risks and hazards of night works and their mitigation measures and should be provided all the protective aids (PPEs) including fluorescent/retro-reflective vests;
- Horns should not be permitted by equipment and vehicles;
- Workers should not shout and create noise;
- First aid and emergency vehicles should be available at site;
- Emergency preparedness plan should be operative during night works;
- Old persons and pregnant women and women having small kids should not work in night time;
- All the vehicles and equipment being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise;
- All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works;
- PIU site engineers and contractors' safety personnel should closely monitor the safety of works continuously and noise and illumination levels on hourly basis and maintain photographic and videographic records as well as register the observations;
- Night works should be stopped early in the morning at least one hour before start of pedestrian/traffic movement;
- After completion of night works all the site should be cleaned and maintained obstruction free for day time movement of vehicles and pedestrians;
- Drivers and workers should be alert and responsive during night works;
- All the wages to workers working in night hours should be as per the applicable labour acts;
- Avoid any nuisance which may create problems to nearby habitants and work peacefully during night hours; and
- Night works should not be conducted near hospitals and during peak seasons such as peak tourist season, students' exam times etc.

114. **Accessibility**. Excavation along the roads for laying of distribution and transmission pipeline, hauling of construction materials and operation of equipment on-site can cause traffic problems. Roads connecting sites are narrow and carry considerable local traffic, mainly comprise bicycles, 2 wheelers, Mini trucks, auto rickshaws, buses etc., Works related to all the remaining components will be confined to the selected sites, therefore there is no direct interference of these works with the traffic and accessibility. Hauling of construction material, equipment, construction waste, etc., to and from the work site may increase the road traffic on local roads, which are not in good condition. This will further inconvenience the local community and road users. Potential impact is negative but short term and reversible by mitigation measures. Separate demarcated access will be temporarily arranged for nearby sensitive receptors like school. Anganwadi, religious places & health center located adjacent to the proposed construction areas. Accordingly, Traffic Management Plan (TMP) be prepared

covering requirement of traffic diversion or control. Sample Traffic Management Plan template attached as Error! Reference source not found. The DBO contractor will be required to:

Hauling (material, waste/debris, and equipment) activities

- Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
- Schedule transport and hauling activities during non-peak hours;
- Locate entry and exit points in areas where there is low potential for traffic congestion;
- Drive vehicles in a considerate manner; and
- Notify affected public by public information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.

Pipeline works

- Confine work areas along the roads to the minimum possible extent; all the activities, including material and waste/surplus soil stocking should be confined to this area. Proper barricading / use of caution tape should be provided; avoid material/surplus soil stocking in congested areas – immediately removed from site/ or brought to the site as and when required
- In case of presence of community structures, health facility or religious places, plan work activity in the night time using proper equipment's and alternative access should be provided.
- Leave spaces for access between mounds of soil to maintain access to the houses/ properties
- Provide pedestrian access in all the locations; provide wooden/metal planks over the open trenches at each house to maintain the access.
- Inform the affected local population, sensitive receptors 1-week in advance about the work schedule
- Plan and execute the work in such a way that the period of disturbance/ loss of access is minimum.
- Construction time need to kept minimums near protected areas.
- Keep the site free from all unnecessary obstructions;
- Coordinate with Traffic Police for temporary road diversions, where necessary, and for provision of traffic aids if transportation activities cannot be avoided during peak hours.

115. **Socio-Economic – Income**. All the project components are located on government lands and there is no requirement for land acquisition or any resettlement. Resettlement and social issues are being studied in a parallel resettlement planning study of this subproject. Blocking of access to the business / livelihood activities, especially during pipeline laying along the roads, may impact the income of households. However, access will be maintained during pipeline works, no notable impact is envisaged. The DBO contractor will be required to:

- Prepare and implement spoils management plan;
- Leave spaces for access between mounds of soil;
- Provide walkways and metal sheets where required to maintain access across for people and vehicles;
- Increase workforce in the areas with predominantly institutions, place of worship, business establishment, hospitals, and schools;

- Consult businesses and institutions regarding operating hours and factoring this in work schedules;
- Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.
- Notify community/ water users in advance about likely interruptions in water supply.
- Provide alternate sources of clean water until water supply is restored.

116. **Socio-Economic – Employment**. Manpower will be required during the 30-months construction stage. This can result in generation of temporary employment and increase in local revenue. Thus, potential impact is positive and long-term. The DBO contractor will be required to employ local labor force as far as possible.

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

- Comply with all national, state, and local labour laws **(Appendix 5);**
- Develop and implement site-specific occupational health and safety (OHS) Plan along with COVID-19 SOP which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment; (c) OHS Training[12] including COVID 19 for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;
- Ensure availability of first aid box at work site;
- Ensure the workers follow COVID 19 SOP and implement accordingly (COVID 19 SOP guideline attached in **Appendix 12**);
- Provide medical insurance coverage for workers
- Maintain Safe distance at work and use of Mask should be encouraged for safeguard from COVID-19
- Secure all installations from unauthorized intrusion and accident risks;
- Provide health and safety orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;
- Make sure vaccination against COVID-19 is done for the labourers
- Ensured the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
- Ensured moving equipment is outfitted with audible back-up alarms;
- Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general

[12] Some of the key areas that may be covered during training as they relate to the primary causes of accidents include (i) slips, trips and falls; (ii) personal protective equipment; (iii) ergonomics, repetitive motion, and manual handling; workplace transport; and (v) legislation and responsibilities. Training can provide the foundations of competence but it does not necessarily result in a competent worker. Therefore, it is essential to assess staff competence to ensure that the training provided is relevant and effective. Supervision and monitoring arrangements shall be in place to ensure that training has been effective and the worker is competent at their job. The level of supervision and monitoring required is a management decision that shall be based on the risks associated with the job, the level of competence required, the experience of the individual and whether the worker works as part of a team or is a lone worker.

public as appropriate;
- Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.
- Provide supplies of potable drinking water;
- Provide clean eating areas where workers are not exposed to hazardous or noxious substances

118. **Work within River for intake construction.** Since during construction of intake worker should have to work within the river, special precaution particularly using safety equipment and training on swimming and mitigation under emergency is necessary.

119. **Community Health and Safety**. Pipeline works along the road, and hauling of equipment and vehicles have potential to create safety risks to the community. Hazards posed to the public, specifically in high-pedestrian areas may include traffic accidents and vehicle collision with pedestrians. Works in hill areas will have potential adverse impacts on the surrounding community, especially during rains. Excavation and erosion may lead to landslides, and may endanger lives, and damage structures. Disturbing free flow of runoff, accumulation of water, distance to drainage lines from construction works, or material / waste dumping, etc./. may lead to landslides/slips. Potential impact is negative but short-term and reversible by mitigation measures. The DBO contractor will be required to:

- Restrict construction vehicle movements to defined access roads and demarcated working areas (unless in the event of an emergency);
- Restrict meetings in crowded places and follow COVID-19 SOP for safeguarding against COVID-19
- Enforce strict speed limit (20-30 kmph) for playing on unpaved roads, construction tracks;
- Restrict speed of the vehicle and equipment near sensitive receptors
- Ensure that no excavation or ground breaking activities are conducted during the rains;
- Clear the sites of materials and wastes before the onset of monsoon; do not block or divert or damage any channels, surface drainage lines; ensure that any blocks are cleared, and runoff is allowed to flow downstream.
- Any disturbed surfaces are properly consolidated, and erosion risk must be eliminated.
- Places where trees/vegetation is cleared for works, ensure proper consolidation and/or protection prior to onset of monsoon
- Monitor newly cut/filled surfaces, and take necessary measures to prevent soil erosion
- Night-time driving will be by exception only, as approved by the PIU to minimise driving risk and disturbance to communities;
- Adopt standard and safe practices for micro tunneling (if any)
- Temporary traffic control (e.g. flagmen) and signs will be provided where necessary to improve safety and provide directions;
- All drivers will undergo safety and training; along with COVID-19 awareness
- Public access to all areas where construction works are on-going will be restricted through the use of barricading and security personnel;
- Separate barricading needs to be provided near adjacent sensitive receptors like school, Anganwadi, health center and religious places;

- Warning signs, blinkers will be attached to the barricading to caution the public about the hazards associated with the works, and presence of deep excavation;
- The period of time when the pipeline trench is left open will be minimized through careful planning;
- Control dust pollution – implement dust control measures as suggested under air quality section;
- Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure;
- Provide road signs and flag persons to warn of on-going trenching activities.

120. **Chance finds.** For this project, excavation will occur at locations not known to have archaeological values. Except in Udaipur, there are no notable monuments or places of archeological interest in project areas. In Udaipur town, works proposed close to ASI monuments are for laying pipelines, and excavation will be limited to 1-1.2 m only. Although limited, risk of uncovering archaeological remains during the excavations cannot be ruled out completely in project towns. DBO Contractors therefore should follow the below measures in conducting any excavation work:

- Create awareness among the workers, supervisors and engineers about the chance finds during excavation work;
- Stop work immediately to allow further investigation if any finds are suspected;
- Inform local Archaeological Department if a find is suspected and take any action, they require to ensure its removal or protection in situ; and prepare a chance find protocol

121. **Works near ASI monuments, and other religious, and cultural places**. Chaturdasha Devta temple and Gunavati Group of temples in Udaipur town which ASI protected sites. Except proposed water distribution lines to serve the residential areas around these sites, none of the components like Intake, WTP and overhead tanks are located within 500 m of these temples. Nearest work (water supply pipeline) is about 57 m from the Chaturdasha devta temple and 38 m from Gunavati group of temples boundary. The proposed pipe laying areas are already developed urban area with houses, roads utilities and all other urban facilities. The proposed pipelines will be laid under existing roads, the construction sites and ASI protected monuments are separated by existing houses. Proposed pipelines will be buried underground (1 m below the ground). The width of trench to be excavated to be about 300-400 mm wide and 1 m deep. There may be temporary impacts during construction The prominent wind direction in Udaipur is north to south most of the works are planned in western direction of monuments. Construction works may also disturb / inconvenience community and visitors. Measures are required to minimize the impact. Following measures shall be implemented: -

(i) During the detailed design, PIU to consult ASI (in Udaipur / Agartala) with exact distance and depth of waterlines works within 300 m of the monuments, and include any feedback or measures as suggested by ASI in into design/construction; obtain prior ASI permission for construction if required

(ii) Prior to commencement of construction, consult with concerned religious authorities of these temples, nearby people and devotees and explain the work method and duration of proposed works, take their suggestions and comments in scheduling and conducting the works

(iii) No construction camps (workers accommodation, material / waste / soil storage) should be established within 500 m of the monuments in Udaipur

(iv) Do not use equipment that generate heavy noise, ground vibration, dust etc., (such as pneumatic drills, dozers etc.), within 100 m of ASI monuments
(v) Put in place proper dust and noise control measures
(vi) Adjacent to religious/social/historical buildings, undertake excavation and construction work in such a way that no structural damage is caused to the structures
(vii) Observe the local rituals and important dates of festivals, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrance/obstacles during such time to the religious places
(viii) Provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.
(ix) Ensure proper traffic management planning to minimize the disruption to the normal traffic flow in the area and ensure the safety of the people.
(x) Clear the work site of unnecessary material, equipment, and debris / surplus soil; do not stock material / soil at the sites
(xi) Conduct continuous consultations with the local people during the works

122. **Construction Camps.** Contractor will set up a construction camp within the WTP, tube well locations or OHSRs site – for temporary storage of construction material (pipes, cement, steel, fixtures, fuel, lubricants etc.,), and stocking of surplus soil, and include separate living areas for migrant workers. The contractor is however encouraged to engage local workers as much as possible. Operation of work camps cause temporary air, noise and water pollution, and may become a source of conflicts, and unhealthy environment if not operated properly. Potential impacts are negative but short-term and reversible by mitigation measures. The DBO contractor is required to:

(i) As far as possible locate the camp site within the work sites; if any camp to be established outside these, then select a camp site away from residential areas (at least 50 m buffer shall be maintained)
(ii) Avoid tree cutting for setting up camp facilities
(iii) Ensured that a proper compound wall is provided, and erect a wind/dust screen around
(iv) Camp site shall not be located near (100 m) water bodies, flood plains flood prone/low lying areas, or any ecologically, socially, archeologically sensitive areas;
(v) Construction camp must be safeguarded from COVID -19 including safe eating area, maintaining Hygiene inside camp, ensure physical distancing measures
(vi) Separate the workers living areas and material storage areas clearly with a fencing and separate entry and exit
(vii) Provide proper temporary accommodation with proper materials, adequate lighting and ventilation, appropriate facilities for winters and summers; ensure conditions of livability at work camps are always maintained at the highest standards possible;
(viii) Consult cluster-PIU before locating project offices, sheds;
(ix) Minimize removal of vegetation and disallow cutting of trees
(x) Ensure conditions of livability at work camps are always maintained at the highest standards possible; living quarters and construction camps shall be provided with standard materials (as far as possible to use portable ready to fit-in reusable cabins with proper ventilation); thatched huts, and facilities constructed with materials like GI sheets, tarpaulins, etc., shall not be allowed as accommodation for workers
(xi) Camp shall be provided with proper drainage, there shall not be any water

accumulation

(xii) Ensure COVID vaccination is done for all the labours involved in the work

(xiii) Provide drinking water, water for other uses, and sanitation facilities for employees

(xiv) Prohibit employees from cutting of trees for firewood; contractor should be provided proper facilities including cooking fuel (oil or gas; fire wood not allowed)

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

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

(xvii) Manage solid waste according to the following preference hierarchy: reuse, recycling, and disposal to designated areas; provide a compost pit for biodegradable waste, and non-biodegradable / recyclable waste shall be collected and sold in local market

(xviii) Remove all wreckage, rubbish, or temporary structures which are no longer required

123. At the completion of work, camp area shall be cleaned and restored to pre-project conditions and submit report to PIU; PIU to review and approve camp clearance and closure of work site Guidelines for setting up camp is attached as **Appendix 12**.

124. **Social and Cultural Resources.** Significant negative social impacts in project are not anticipated. Site of social/cultural importance (schools, hospitals, and religious places) may be distributed by noise, dust, safety risks and impeded access. There are schools located close to the project sites, and these may pose safety risks to school children, staff and visitors. This short-term impact, mitigated by the following mitigation measures.

(i) Avoiding working at sensitive times,

(ii) Limiting dust by removing waste soil quickly, bringing sand to site only when necessary, covering and watering stockpiles, and covering soil and sand when carried on trucks;

(iii) Using modern vehicles and machinery with standard adaptations to reduce noise and exhaust emissions, and ensuring they are maintained to manufacturers' specifications.

(iv) Implement community health and safety measures recommended above; isolate work site from the school access road; provide proper barricading to prevent entry of children / public into work site; create awareness

(v)

125. **Post-construction clean-up and reinstatement.** Construction debris, spoils, and excess construction materials may pose hazards to properties, community and environment if left unattended after construction.

(i) The contractor will reinstate all working areas and access routes as work proceeds during construction. All plant, equipment, materials, temporary infrastructure, and vehicles will be removed at the earliest opportunity and the surface of the ground restored as near as practicable to its original condition. The following generic measures should be taken up:

- Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required;
- All excavated roads shall be reinstated to original condition;
- All disrupted utilities restored;
- All affected structures rehabilitated/compensated;

- The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up;
- All hardened surfaces within the construction camp area shall be ripped;
- All imported materials removed, and the area shall be top soiled and regressed using guidelines set out in the re-vegetation specification that forms part of this document;
- The contractor must arrange the cancellation of all temporary services;
- Request cluster-PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.

E. Operation and Maintenance Impacts

126. Operation and Maintenance of the water supply system will be carried out by DBO contractor for first 5 years than DWS directly or through an external operator. Operation will involve intake of water through pumping, treatment of water in the WTP, disinfection with chlorine, conveying clear water by pumping from clear water reservoir to respective OHSRs and finally distribution of water at DMA areas.

127. Following measures are suggested for implementation/ compliance during the operation phase:

- Ensure that water supplied to the consumers at all times meet the drinking water standards (**Appendix 8**); carry out regular sampling and testing, and disseminative information;

128. During the system design life (15/30 years for mechanical/civil components) it shall not require major repairs or refurbishments and should operate with little maintenance beyond routine actions required to keep the equipment in working order. The stability and integrity of the system will be monitored periodically to detect any problems and allow remedial action if required. Any repairs will be small-scale involving manual, temporary, and short-term works involving regular checking and recording of performance for signs of deterioration, servicing, and replacement of parts. Recurrence of pipe bursting and leakage problems can be managed by the leak detection and water auditing surveys. DWS will ensure that the leak detection and rectification time is minimized.

129. Water supply system will be operated using the standard operating procedures following an operating manual, which will be prepared by the DBO contractor. This will cover all necessary items such as preventive maintenance, periodic maintenance and emergency maintenance, replacement of pumps, motors, and other electro-mechanical parts as per the design life to optimize energy use and system efficiency etc., Adequate resources – technical and financial, has been taken into consideration in the project design. Manual will also include safety awareness and mock drills for chlorine safety. Thus, considering the design and proposed operational procedures, it is unlikely that there will be any significant negative impacts due to WTP operation.

130. **Water treatment Plant:** Impact of WTP (at Udaipur) operation is from (i) generation of wastewater and sludge, (ii) noise from operation of pumps and motors, (iii) chlorine gas leakage risk, and (iv) consumption of electricity. All of these are duly considered in the design of WTP, and various measures such as the following are already incorporated into the project design:

- Recirculation and recovery of wastewater including backwash water generated from treatment process - backwash water from filter beds will be sent to a sump,

and after allowing adequate time for settlement of solids, clarified water will be pumped back to WTP inlet. This arrangement will avoid pollution and minimize wastage of water.

- Collection of accumulated sludge, thickening, drying and reuse
- Designing the entire system to maintain optimal flow and terminal pressure, and optimizing the overall energy usage;
- Using low-noise and energy efficient pumping systems;
- Installing the noise-producing pumps and motors etc., in enclosed buildings with noise reducing walls, and also maintaining adequate buffer to the nearby inhabited areas;
- Provision of appropriate personal protection equipment to the workers and staff, and
- Developing chlorine facility with all necessary safety measures.

131. Since backwash water will be recovered and recirculated in the WTP, no wastewater will be generated from water treatment process. Water treatment process will generate sludge.

132. **Handling and safe disposal of sludge from WTP-** Surface water Treatment for potable supplies typically involves coagulation, flocculation, Sedimentation, and filtration processes for removing colloidal as well as suspended solids from raw water. All water treatment plants (WTPs) produce waste/residue known as Water Treatment Sludge (WTS) during the purification of raw water. The sludge produced in a typical WTP generally consists of about 45-65% fine sand in grain size range 150-75µ. Silica, alumina, ferric oxide and lime constitute the major percentage of chemical components present in the sludge. Sludge is produced from sedimentation of particulate matter in raw water, flocculated and precipitated material resulting from chemical coagulation, residuals of excess chemical dosage, plankton etc.; and waste from rinsing and back washing of filter media containing debris, chemical precipitates, straining of organic debris and plankton. Quality of sludge will also depend on the quality of raw water. In the WTP sludge will be collected, thickened, dried and disposed off or reused for beneficial purposes.

133. Utilization of dried sludge in brick making, in ceramics making, etc., could provide safe disposal route. It also can be used as soil conditioner. DBO contractor will prepare a sludge management plan for safe handling and disposal of sludge from WTP. During trial commissioning sludge coming out from WTP needs to be tested in laboratory for the constituents, and periodic testing will also be conducted. Surplus / unused sludge will be disposed at municipal waste disposal site.

134. **Use of Chlorine as Disinfectant**. It is proposed to use chlorine at WTP to disinfect the water prior to supply to consumers. There is invariably a safety risk when considerable quantities of chlorine are handled at the WTP. Chlorine cylinders will be brought by trucks to the site, installed and operated to disinfect the water supplies. Since facilities are located in the urban area, precautions are needed to ensure the safety of both workers and nearby community. Automation of chlorination system including automatic dosing & change-over, leak detection and neutralizing system is proposed to be provided.

1. Control Philosophy

135. The system is designed for 1-stream each working in pre & post chlorination system and 1-stream as standby in both pre & post chlorination system. In this system the following

main equipment have been incorporated:

- 2 nos. tonner manifold systems with pressure indicator, pressure switch and motorized valve.
- Ball valve on chlorine gas line
- Chlorine gas filter
- Pressure reducing valve
- Floor mounted vacuum type chlorinator with remote vacuum regulator, pressure relief valve, vacuum indicator, flow meter, automatic flow control valve, vacuum relief valve, drain valve, check valve and injector
- Electrical auto change-over device
- Pipes, fittings and valves
- Suitable booster pump with motor (1 working and 1 standby)
- Pressure indicator on booster pump delivery
- Common relay-based starter cum control panel with annunciator for chlorination.

2. System Description

136. Chlorine gas will be drawn from the Ton Container. This system is equipped with pressure indicator, pressure switch and electrical auto change-over device. The pressure indicator will locally indicate the duty tonner pressure and pressure switch will give a low alarm at the control panel indicating that the duty tonner is empty and also will enable auto change of tonner manifold with the help of motorized valve.

137. A pressure switch and motorized valve are provided on each manifold. When the system is started both manifolds are full, but only one manifold will open as it is selected first which is referred as manifold - I. It shall remain open till the time the tonner connected to manifold - I is empty. As soon as the pressure on the manifold - I falls below the pre-set point, the motorized valve will close automatically on manifold - I and open the motorized valve on manifold - II. Meanwhile the operator should change manifold - I with fresh tonner. Once the manifold - I also become empty the control panel resets itself and open manifold - I.

138. The chlorine gas coming out of the tonner passes through gas filter and pressure reducing valve where the chlorine gas pressure is reduced to 2 to 2.5 kg/cm^2. The chlorine gas then enters the vacuum regulator. The vacuum is created by the water flowing through the injector. Water for the injector is supplied by the booster pump. The chlorine gas, under vacuum, flows through the flow meter, flow control valve to the injector. In the injector chlorine gas mixes with water and the concentrated chlorine solution is conveyed to the dosing point through diffuser. The flow is automatically adjusted as per the flow of water in the channel. For these 4 to 20 mA signals has to be provided from channel. A manual override is also provided for adjusting the flow manually.

139. Following safety features are provided in the system:

- Gas filters are provided in the gas line to filter any ferric chloride impurities in the chlorine gas.
- The remote vacuum regulator is incorporated for utmost safe operation. Unless vacuum is created on the downstream side, no chlorine gas would enter the chlorinator. If a leak develops between the downstream side of the system and the injector, the remote vacuum regulator will automatically shut the flow of chlorine gas into chlorinator.

- A pressure relief valve is provided in the vacuum regulator/ chlorinator for venting of any pressurized chlorine coming into the chlorinator.
- A vacuum relief valve is provided in the chlorinator to release the excess vacuum in the system especially when the system is not working. This will avoid deformation of PTFE diaphragms in the system.
- A check valve provided in the vacuum line to prevent back flow of water into the chlorinator.
- A drain valve is provided on the check valve, which automatically drains out any water accumulated in the check valve.

140. Guideline for chlorine use at WTP is shown in **Appendix 7.**

3. Leak Absorption System

141. The main equipment of the chlorine leak absorption system is as under:

- Blower with motor and piping
- FRP frontal hood is provided in front of every tonner. The hood is in two halves. The bottom half is placed on the floor on top of the duct. The top half of the hood is placed on the bottom half.
- The duct is connected to the absorption system/ blower. When a tonner develops a leak the same will be sucked through the duct.
- Pumps will pump supply and spray caustic solution for absorption of chlorine from the gas and finally clean air free form chlorine will be discharge from top of the FRP absorption tower.
- A chlorine leak detector provided in the tonner/ chlorinator room shall detect a leak and give out a signal to the control panel.

142. The blower shall suck the leaked chlorine gas along with air and deliver the same to the caustic pit.

143. Chlorine cylinders (called tonners of capacity 900 kg) will be procured from nearest manufacturing unit and stored at the site. Tonners sufficient for a month will be stored in the storage; i.e. 2-3 cylinders will be stored at the WTP.

144. Following measures will also be considered in developing and operating chlorination system:

- Chlorine neutralization pit with a lime slurry feeder;
- Proper ventilation, lighting, entry and exit facilities;
- Visible and audible alarm facilities to alert chlorine gas leak;
- Facility for isolation in the event of major chlorine leakage;
- Eye wash and shower facility;
- Personal protection and safety equipment for the operators in the chlorine plant (masks, oxygen cylinders, gloves, etc.);
- Provide training to the staff in safe handling and application of chlorine; this shall be included in the contract of Chlorinator supplier;
- Supplier of Chlorinator equipment shall provide standard operating manual for safe operation and as well as maintenance and repairs; preferably these shall be provided both in English and Bengali Languages.

145. **Iron Removal Plant (IRP).** The material of the INDION ISR resin is designed in such a manner that the precipitated Iron from the water does not get deposited or get coated over the resin surface, hence the Iron precipitates can be easily washed off by backwash flow (INDION ISR Treated Water). If the water contains impurities other than Iron like Turbidity, COD, Oil and Grease, acidic pH (< 7), Heavy metals, Chlorine, Hydrogen Sulphide, etc. then it will hamper INDION ISR performance gradually. The parameters should be NIL in water before passing through INDION ISR. Considering the above factors, the replacement frequency can be considered as 3 years for inlet Iron content > 3 ppm and 4 to 5 years for inlet Iron content < 3 ppm.

146. Basic theory of conversion of dissolved Iron with iron specific resin is as follows: Iron Specific Resin has manganese dioxide as a catalytic moiety which works as a catalyst to promote iron oxidation. Basically, iron and oxygen are attracted to manganese dioxide where dissolved iron (Fe+2) converts to insoluble iron (Fe+3) which can be filtered through the resin. During backwash, the surface of resin is scoured, converting it to manganese dioxide, which is further used for oxidation of iron. Back wash water is nontoxic and less in volume can be discharged safely. Backwash water will be temporarily stored in a tank and clarified water will be discharged into drains, and the sediment will be disposed off along with solid waste.

147. **Repairs and Maintenance of water supply system.** Repair works could cause some temporary disruption of activities at locations of social and cultural importance such as schools, health services, religious places, tourist sites etc., so the same precautions as employed during the construction period should be adopted. All MC needs to require its O & M contractor to:

(i) Consult ASI, custodians of important buildings, cultural and tourism authorities and local communities in advance of the work to identify (a) any buildings at risk from vibration damage resulting from repair works, and (b) address key issues, and avoid working at sensitive times, such as religious and cultural festivals.
(ii) Extra precaution to be taken during any repairing work near sensitive receptors. All mitigation measures as mentioned in construction phase, same will be applicable for O & M phase.
(iii) Complete work in these areas quickly.

148. **Increase wastewater generation and safe disposal**. With enhanced water supply in three project towns, volume of wastewater will be increased. As per generic consideration, about 80% of water is generated as wastewater. At present there is no sewerage system is these towns. Individual households discharge sewage into septic tanks, and gray water (from kitchen and bath) is discharged into open drains. To an extent, there is also direct discharge of sewage and disposal of supernatant from septic tanks into open drains. Open drains are intended for surface runoff during rains, and discharge of wastewater into these drains is polluting the receiving waters and also creating unhealthy conditions. In Melaghar, part of the town drains into Rudrasagar wetland, therefore entry of wastewater into open drains shall be prevented.

149. Considering this, Government of Tripura proposed to implement a project under AMRUT / similar program of Government of India. This project includes interception of major drains in the core area and the collection and conveyance of the intercepted wastewater to the final intercepting point by gravity sewer and collection of wastewaters in the collection well at the final intercepting point. From the final intercepting point the wastewater will be conveyed by means of 200 mm DI K9 mains through pumping to the proposed STP. At STP, the wastewater will be treated by Moving Bed Bioreactor (MBBR) technology and septage as collected from septic tanks will be cotreated in the same STP, and treated wastewater meeting the discharge

standards. The treated effluent shall be discharged into the river or to the land for agriculture purpose depending upon the need of public in the nearby area.

150. Major drains in the core area of the towns are identified for interception and diversion to the proposed STP site. Other drains are far away from the core area, and it may not be feasible to tap the wastewater in the drains for conveying them to the STP site due to fund constraints. Tendering has been done for "proposed interception and diversion of major drains of core areas and providing STP & Co-treatment of septage and disposal" packages for the towns and construction will be started around July 2023 and expected to be commissioned by June 2025.

151. In Bishramganj panchayat area, no as such treatment of sewerage and nalla waste water planned at this stage. But in future same strategy will be applied for waste water treatment for Bishramganj.

152. **Project Benefits.** The citizens of the Udaipur, Amarpur, Bishramganj, Melaghar, and Belonia areas will be the major beneficiaries of the improved water supply, as they will be provided with a constant supply of better-quality water, piped into their homes at an appropriate pressure. The project will improve the over-all health condition of the project area by controlling water borne diseases, so people should spend less on healthcare and lose fewer working days due to illness. Their economic status should also improve, as well as their overall health. This should also improve the environment of these areas, should deliver major improvements in individual and community health and well-being.

VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Overview

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

B. Public Consultation

154. The public consultation and disclosure program are a continuous process throughout the project implementation, including project planning, design and construction.

1. Consultation during Project Preparation

155. Institutional consultations were conducted with the project agencies, and Government Departments of Tripura, Tripura State Pollution Control Board, etc. The subproject proposal is formulated in consultation with the local bodies in the project area to suit their requirements. The following methodologies have been used for carrying out public consultation:

(i) Local communities, individuals affected and owners and employees of affected commercial establishments who are directly or indirectly affected were given priority while conducting public consultation.
(ii) Walk-through and informal group consultations in the proposed subproject area.
(iii) The local communities had been informed through public consultation about the project and its benefits.

(iv) The environmental concerns and suggestions made by the participants were listed and discussed. The suggestions were incorporated in the EMP.

156. The main objectives of the consultation programs were to inform stakeholders on adverse environmental & social impacts, efforts to minimize and mitigate negative impacts while making people aware of the Water supply project benefits. Different techniques of consultation with stakeholders were used during project preparation (interviews, official meeting, public meetings, etc.). A socio-economic household survey has been conducted in the project area, covering sample households, to understand the household characteristics, health status, and the infrastructure service levels, and also the demand for infrastructure services. General public and the people residing along the project activity areas were also consulted during visits to the project sites. The stakeholders were involved in developing the IEE through focus group discussions (FGD) and public consultation at project area level, after which views expressed were incorporated into the IEE and in the planning and development of the project.

157. A workshop on Environment and Social safeguards has been arranged on 19th-20th December 2022 at Agartala for all the ULBs (main stakeholders) and project executing and implementation agencies. The primary intent of the orientation workshop was to enhance the knowledge base of the ULB officials, TUDA officials and officials of UDD on the mentioned disciplines. Focus Group Discussions (FGD) have been carried out at different locations (wards) of the project area.

158. In **Udaipur** Stakeholder Consultation has been carried out at 8 locations: with 78 nos. of participants. Among 78 participants, female no. 27 which is 35%. FGD has also been carried out with 132 persons, out of which almost 62% are female. In **Amarpur** Stakeholder Consultation has been carried out at 4 locations; with 32 nos. of participants, out of which almost 19% are female. In FGDs Total 69 persons participated in discussion, out of which almost 56% are female. In **Bishramganj** FGDs was conducted along the project alignment in month on April, September and October 2022 with 39 participants (11 male and 28 females, almost 72% female). Stakeholder consultation was attended by 39 stakeholders in 5 different places, out of total participant female contribute 50%. In **Melaghar** Focus group discussion has been conducted along the project alignment in the month of March 2022 with 31 participants (5 Male and 26 Female). Stakeholder consultation was attended by 61 stakeholders, out of which 20% are female. In **Belonia** Focus group discussion has been conducted along the project alignment in the month of January, February, and March with 94 participants (65 Male and 24 Female, almost 26% female). Stakeholder consultation was attended by 28 stakeholders, out of which only 10% female.

159. All participants expressed need for the project and willingness to take it up and stakeholders were very supporting of the project and promises to extend full cooperation during the construction phase as the activities are proposed to improve the water supply service levels and the living standards. Quality of supplied water is more or less good, only concentration of iron is high. The public expressed their concern regarding the nuisance and disturbance (dust, road closure and traffic management activities) during the construction. Project team explained about EMP which will be implemented during construction. Feedback from the consultation is summarized below and details along with photographs and attendance sheets are provided in **Appendix 10**. Further a project-level consultation meeting will also be conducted in the project area.

- The project area has insufficient and inadequate drinking water supply. Households are facing severe water crisis during the summer season when the ground water level drops.

- High iron content in drinking water.
- The representative from community raised issue regarding the existing water supply quality is not up to the mark. People are concerned about the poor supply (two times in a day for 1 -2 hour each time) and quality of water.
- People are supportive of the project and understand that proposed works will improve health and environmental conditions of town and chances of waterborne diseases will be mitigated.
- Women had heard about the proposed project and welcomed it as women are facing many problems in fetching water for hours.
- Aware of short-term impacts during the works such as dust generation, noise level, access problem, inconvenience for public and movement of vehicle. People demanded for the measures of dust suppression such as water sprinkler to control dust and noise during construction phase. Project team informed stakeholders of the proposed mitigation measures.
- It was also informed no road closures anticipated due to this work, and if needed during the construction phase, alternative access will be provided. Short term impact explained to local public and it assured that the measures will be included in the Environment Management Plan.
- Stakeholder expressed their concern regarding water charges, affordability, disturbance, and loss of business due to the work in market areas, dust, road closure etc.).
- Stakeholders also indicated that a public notice on works, and awareness programs to be conducted
- The project team explained the proposed mitigation measures to mitigate / minimize such issues. Attention of stakeholders drawn to the EMP and explained to them how the construction phase issues by avoided, minimized, or mitigated and managed.

2. Consultation during Implementation

160. Prior to start of construction, PIU in coordination with the local bodies will conduct information dissemination sessions at various places and solicit the help of the local community, leaders/ prominent for the project work. Focus group meetings will be conducted to discuss and plan construction work (mainly pipeline work) with local communities to reduce disturbance and other impacts and regarding the project grievance redress mechanism. A constant communication strategy will be established with the affected communities to redress the environmental issues likely to surface during construction phase. Consultation will continue during implementation and reported through environmental monitoring reports to ADB, semiannually during construction and annually during operation until project completion.

C. Information Disclosure

161. Executive summary of the IEE will be translated in Bengali (local language) and will be made available at the offices of PMU, PIU, Nagar Panchayet and will be displayed on the notice boards. Hard copies of the IEE will be accessible to citizens to disclose the document and at the same time creating wider public awareness. Electronic version of the IEE in English and Executive Summary in Bengali will be placed in the official website of the TUDA (PIU), UDD (PMU) after approval of the IEE by Government and ADB. Stakeholders will also be made aware of grievance register and redress mechanism.

162. Public information campaigns to explain the project details to a wider population is being conducted. Public disclosure meetings will be conducted at key project stages to inform the public of progress and future plan. Prior to start of construction, the cluster- PIU will issue Notification

on the start date of implementation in local newspapers. A board showing the details of the project will be displayed at the construction site for the information of general public.

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

VIII. GRIEVANCE REDRESS MECHANISM

164. A common grievance redress mechanism (GRM) will be in place to receive, evaluate, and facilitate the resolution of social, environmental or any other project related grievances. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project. The public awareness campaign will generate awareness of the project and its grievance redress procedures. The campaign will ensure that the poor, vulnerable, and others know about the GRM.

165. The GRM will provide an accessible, inclusive, gender-sensitive and culturally appropriate platform for receiving and facilitating resolution of affected persons' grievances related to the project. The multi-tier GRM for the project is outlined below, each tier having time-bound schedules and with responsible persons identified to facilitate and address grievances at each stage. ULB-wide public awareness campaigns will ensure that awareness of grievance redress procedures is generated through the campaign. The project coordinator (urban and tourism), supported by independent consultants (social and environment), will be responsible for timely grievance redress on environmental and social safeguards issues.

166. Besides the project's grievance redress mechanism, the state also has a centralized public grievance redress monitoring system (CPGRMS) where the general public can file grievances through a dedicated web portal (grievance.tripura.gov.in). The general administrative (administrative reforms) department is the nodal agency, and an officer of the rank of joint secretary is responsible for its functioning. Each department of the state has nominated officers to receive the grievances. TUDA and DOT have nominated officers of the rank of Deputy Director as nodal officers, whose names and contact details are provided on its website. The affected persons can also lodge their complaints through this online portal.

167. **Information to the stakeholders about the GRM:** The stakeholders, including affected persons, will be informed about the GRM under the project and of the state through public consultations, disclosures, and distribution of public information booklets (PIB). In the case of illiterate DPs, the information will be provided verbally during meetings with them.

168. **Who can complain:** A complaint can be registered by stakeholders directly or indirectly affected by the project. A representative can register a complaint on behalf of the affected person or group, provided that the affected person or group identifies the representative and submits evidence of the authority to act on their behalf.

169. **What the Grievance/Complain should contain:** Any comments, complaints, queries and suggestions pertaining to safeguard compliance - environment, involuntary resettlement, and indigenous people, design-related issues, compensation, service delivery or any other issues or concerns related to the project. The complaint must contain the complainant's name, date, address/contact details, location of the problem area, and the problem. A sample grievance registration form is provided in Appendix 11.

170. **Where and How to file a Complaint:** The complaint can be filed both online and offline. The people can submit their complaints at the contractor's site office or at PIU/PMU office. In addition, they can also have grievances/suggestions/queries submitted through phone or e-mails or the state grievance portal.

171. **Documentation:** PMU, with the support of PIUs, will be responsible for the timely registration of grievances, related disclosure, and communication with the aggrieved party. PMU will also ensure that all the details from submission to resolution are well recorded and documented.

172. **Grievance/Problem Redress through Participatory Process:** The PMU and PIUs must make efforts to resolve the problems and conflicts amicably through a participatory process with the community and the ULBs. In case of immediate and urgent grievances in the complainant's perception, the contractor and supervision personnel from the PIU will provide the most easily accessible or first level of contact to resolve grievances quickly. Contact phone numbers and names of the concerned staff and contractors will be posted and displayed at all construction sites.

173. **Grievance Redressal Committee:** The GOT will establish the grievance redressal committees at the site, PIU and PMU levels to provide a mechanism to mediate conflict and disputes concerning compensation payments and cut down on lengthy litigation. The following will be the composition of the GRCs.

- **Site Level GRC (1st level):** The site-level GRC will comprise a Junior Engineer. PIU, a field engineer of PSMC, safeguard support staff of PSMC, a social supervisor of the contractor and a representative from the affected community (as and when required). The effort will be made to resolve issues on-site, in consultation with each other and within five days of receipt of a complaint/grievance.
- **PIU Level GRC (2nd level):** All grievances that cannot be redressed within five days at the field level will be brought to the notice of the PIU-level GRC established in each PIU. The PIU-level within two days of receipt of the complaint to determine the merit of each grievance brought to the committee. GRC at the PIU level will be headed by Project Manager (executive/ assistant engineer)- focal for safeguards, and include the construction manager of PSMC, safeguards specialists of PSMC, and the Project Manager of the concerned contractor as members. The PIU-level GRC will also co-opt the representative of line departments (PWD, ULB) and a representative from the affected community, as and when required, including indigenous peoples communities or CSO working with indigenous peoples, as and when required.[13]
- **PMU / State Level GRC (3rd level):** In case the grievances are not addressed at the PIU level within 10 days of receipt, the same shall be brought to the notice of the PMU-level GRC. The PMU-level GRC will comprise of Project Director as chairman, a Co-Project Director as co-chairman, a Project Coordinator (Urban and Tourism) as member secretary, environment safeguard officer of PMU and social, gender officer of PMU, women representatives from the line departments (ULB, PWD, Environment and Forests) and representative of affected community (including indigenous people community).[14]

[13] In case of any components with impact on indigenous people, GRC will have representative from affected indigenous people community or NGO working with indigenous people groups.

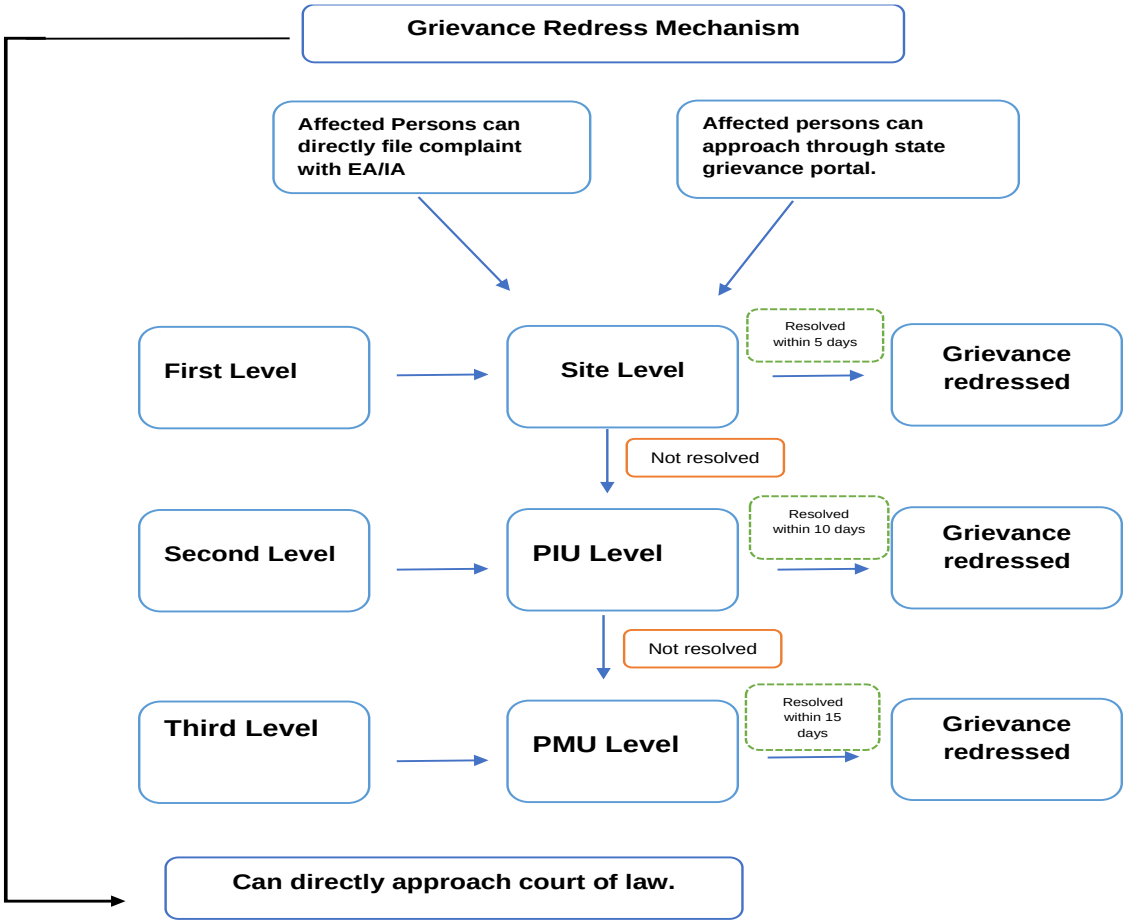
[14] In case of any components with impact on indigenous people GRC will have representative from affected indigenous people community, including at least one female indigenous person or NGO working with indigenous people groups.

The committee can co-opt any other member required for the resolution of the grievances. The GRC at the PMU level will resolve the grievance within 15 days of receiving the complaint.

174. The complainant will be informed in writing about the resolution of their complaint or the decision of the grievance redress committees. The complainants are free to approach the court of law at any time of their own will at any stage, and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

175. Figure below shows Grievance Redressal Mechanism for the project**.**

Figure 85: Grievance Redressal Mechanism (GRM)



IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

176. An environmental management plan (EMP) is being developed to provide mitigation measures to reduce all negative impacts to acceptable levels.

177. The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between Project Management Unit (PMU), Project Implementation Unit (PIU) / TUDA, ULBs (Nagar Panchayat/ Municipal Council), Consultants and Contractors. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries.

178. The DBO contractor will submit to Cluster - PIUs, for review and approval, a Site-Specific Environmental Management Plan (SEMP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per SEMP; and (iv) budget for SEMP implementation. The approved Site-Specific Environmental Management plans will be disclosed in the project website & website links will be provided in Semi- annual Environment Monitoring Report.

179. A copy of the EMP/approved SEMP will be always kept on site during the construction period. The approved EMP to be included in the BID and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

180. For civil works, the DBO contractor will be committed to (i) carry out all of the mitigation and monitoring measures set forth in the approved SEMP; and (ii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer may prepare from time to time to monitor implementation of this IEE and SEMP. The contractor will allocate budget for compliance with these SEMP measures, requirements and actions.

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

Table 26: Design Stage Environmental Impacts and Mitigation Measures

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Responsible for monitoring	Cost and Source of Funds
Location impacts of proposed components - project locations close to protected monuments in Udaipur and close to Rudrasagar Ramsar Wetland in Melaghar	Impact on sensitive areas (ASI monuments, and Ramsar wetland) due to proposed construction works	▪ During the detailed design, PIU to consult ASI (in Udaipur / Agartala) with exact distance and depth of waterlines works within 300 m of the monuments, and include any feedback or measures as suggested by ASI in into design/construction; obtain prior ASI permission for construction if required ▪ Prior to commencement of construction, consult with concerned religious authorities of these temples, nearby people and devotees and explain the work method and duration of proposed works, take their suggestions and comments in scheduling and conducting the works ▪ Prevent dust, noise, accumulated of water, and contaminated surface runoff from the work sites; take necessary measures as needed (these are presented in construction phase impacts-measures) ▪ No construction camps (workers accommodation, material / waste / soil storage) should be established within 500 m of the monuments in Udaipur ▪ No construction camps (workers accommodation, material / waste / soil storage) should be established within 1000 m (1 km) from the boundary of Rudrasagar lake; camps should not be located close to drainage lines/streams that flow into Rudrasagar lake ▪ All project related site staff, construction workers and supervisors, shall be made aware of the sensitive sites, and prevent any harm or damage or disturbance to trees, vegetation, wildlife, birds etc., ▪ Proper accommodation and facilities shall be provided within the camps, and workers shall not use the lake or surroundings for open defecation, bathing, or fishing / hunting, collecting firewood etc. Contractor should put in place, a proper system to monitor the staff and workers to prevent damage/ disturbance.	Contractor / cluster-PIUs/ PIU	PMU	Project Costs

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Responsible for monitoring	Cost and Source of Funds
		▪ Do not use equipment that generate heavy noise, ground vibration, dust etc., (such as pneumatic drills, dozers etc., within 100 m of temples, or within 500 m of Rudrasagar lake ▪ Schedule works during dry season to avoid contaminated runoff from the work sites entering lake; clear the sites of materials, debris, and consolidated the refilled trenches prior to onset of monsoon ▪ Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; ▪ Place storage areas for fuels and lubricants away from any drainage leading to water bodies; ▪ Store fuel, construction chemicals etc., on an impervious floor, also avoid spillage by careful handling ▪ Dispose any wastes generated by construction activities in designated sites; and ▪ Conduct surface quality inspection according to the environmental management plan (EMP). ▪ Conduct continuous consultations with the local people during the works			
Seismic sensitivity	Damage to infrastructure and potential risks: project area in High earthquake risk zone (Zone V)	▪ Designs of project component structures shall comply with relevant codes of design such as Bureau of Indian Standard (BIS) specifications for earthquake resistant design (IS: 1893: Criteria for earthquake resistant design of structures).	DBO Contractor	PMU	DBO Contractor
River Intakes (at Udaipur)	Water quality and ecological impacts	▪ Do not utilize the environmental flow for supply; ensure that environmental flow is available in the river all times; limit the abstraction to allowable limits ▪ Design inlet of intake pipe in the river with appropriate screen to avoid entry of aquatic organisms into inlet ▪ Select a construction methodology that is least disturbing, and appropriate for the in-situ soil condition, and able to complete the construction work prior to onset of monsoon. ▪ Schedule the construction works during low water level period – late winter months to pre monsoon	PIU	PMU	Project Costs

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Responsible for monitoring	Cost and Source of Funds
		(November - March); ensure that works are completed during the same period to prior to onset of monsoon; ▪ Erect temporary barriers to form enclosed construction area with least disturbance ▪ Allow adequate time to settle the distributed solids to prior to pumping out water; only clear/clarified water shall be pumped back into the reservoir; any silt laden water should be pumped to a silt pond ▪ Avoid/minimize use of fuels, chemicals and lubricants; ensure no spillage ▪ Clear the work site after completion at least to pre project conditions, ensure that there are no materials, debris, spills etc., and prior to removal of temporary barriers / coffer dam ▪ Implement work site safety at works in water body			
Groundwater source (Bishramganj and Belonia)	Groundwater contamination	▪ Measures should be taken to control the open defecation, and to close all unsafe latrines (for example pit latrines). ▪ Undertake protection measure to avoid contamination for existing DTWs ▪ Awareness programs shall be conducted regarding the sanitation practices and its effect on groundwater quality	PIU	PMU	PMU costs
Water Treatment Plant (WTP) design (at Udaipur)	Inefficient treatment, treated water characteristics not satisfying the standards	▪ Design treatment process that is suitable for raw water source characteristics duly considering the seasonal variation in quality if any ▪ Duly consider quality of groundwater that will be supplemented for surface water supply variations ▪ Treated water and supplied water at consumer end should meet the drinking water standards all times	DBO Contractor	PMU	DBO Contractor
	Design to prevent pollution due to wastewater and sludge	Ensure that the following are included in the WTP design: ▪ Backwash water reuse system and sludge recovery and disposal system ▪ Backwash recycling components: Filter backwash holding tank, recovered water storage tank and pumping for recycling	DBO Contractor	PMU	DBO Contractor

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Responsible for monitoring	Cost and Source of Funds
		▪ Sludge management system components: Gravity thickeners for sludge from clarifiers, mechanical sludge dewatering system, storage facility for dewatered sludge ▪ Disposal of sludge at a landfill or the disposal site provided by the ULB			
	Sludge management	▪ Prepare sludge management plan for safe handling and disposal of sludge from WTP ▪ Estimate the quantity of sludge / solids generated from the WTP during the detailed design phase, and likely composition based on the raw water quality and process chemicals ▪ Minimize the quantity of solids generated by the water treatment process through optimizing coagulation processes; ▪ Recover process chemicals to the extent possible to minimize / prevent the disposal ▪ Carryout pre-treatment prior to disposal ▪ Dispose dried sludge / solids from WTP at approved solid waste landfill / disposal site identified by ULB; this should be identified during the detailed design phase ▪ Evaluate the option of land application during the operation stage; conduct quality tests on the first batch of sludge generated from the WTP, check for physico-chemical characteristics including heavy metals ▪ Manage hazardous/harmful waste if any, as per the Hazardous Waste Management Rules ▪ Employ safe and beneficial methods for disposal of dried sludge: in building and construction industry, brick / tile manufacturing etc.,	DBO Contractor	PMU	DBO Contractor
Existing WTPs	Environment and health impacts due to improper disposal of wastewater and sludge, poor chemical handling,	▪ Conduct detailed technical assessment of WTP during the detailed design phase and identify the improvements required. ▪ Conduct raw and treated water quality monitoring (at inlet and outlet)	PIU / DWS	PMU	DWS / PMU costs

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Responsible for monitoring	Cost and Source of Funds
	waste management and occupational health and safety	▪ Undertake necessary improvements at the WTPs either part of the project or through DWS ▪ Ensure that WTPs are improved as required, and ensure that treated water quality meets the drinking water standards, and waste management, material management and health and safety practices are improved			
Design of water supply system	Source sustainability and efficiency	▪ Select sustainable water source ▪ The entire system is designed to maintain optimal flow and terminal pressure, and optimizing the overall energy usage ▪ To meet the drinking water standards, implementation of a water quality surveillance program ▪ Using low-noise and energy efficient pumping systems ▪ Installing the noise-producing pumps and motors etc., in enclosed buildings with noise reducing walls, and also maintaining adequate buffer to the nearby inhabited areas ▪ Provision of appropriate personal protection equipment to the workers and staff	Contractor / cluster-PIUs/ PIU	PMU	Project Costs
Selection of DTW 3 Site at Belonia	Contamination from nearby non-functional septic tank	▪ Use of nonpermeable pipes MS/ PVC and other components for DTW construction ▪ Depth of DTW will be 200 m and strainer at 160 m and below reduces chance of any contamination ▪ Ensure a minimum of 30 m distance from septic tank / its discharge point. If land available, this distance can be increased to 50 m ▪ The borewell and septic tank should be on the opposite corners and preferably diagonally opposite to each other with sufficient distance. ▪ Testing of ground water from nearby tube well will be done before start of drilling for DTW. After development period water samples from new deep tube well will be collected for analyzing chemical and biological parameters.	Contractor / cluster-PIUs/ PIU	PMU	Project Costs

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Responsible for monitoring	Cost and Source of Funds
Chlorine gas usage as disinfectant at Water Treatment Plant (WTP) (at Udaipur)	Chlorine handling and application risk – health and safety risk to workers and general public	In final design, the following measure will be provided at the chlorine application unit: ▪ Chlorine neutralization pit with a lime slurry feeder ▪ Chlorine absorption and neutralization facility ▪ Proper ventilation, lighting, entry and exit facilities ▪ Visible and audible alarm facilities to alert chlorine gas leak ▪ Facility for isolation in the event of major chlorine leakage ▪ Eye wash and shower facility ▪ Personal protection and safety equipment for the operators in the chlorine plant (masks, oxygen cylinders, gloves, etc.,) ▪ Provide training to the staff in safe handling and application of chlorine; this shall be included in the contract of Chlorinator supplier ▪ Supplier of Chlorinator equipment shall provide standard operating manual for safe operation and as well as maintenance and repairs; preferably these shall be provided both in English and Bengali Languages. Guidelines for safety for Chlorine usage attached in **Appendix 7.**	Contractor / cluster-PIUs/ PIU	PMU	Project Costs
Layout plan of intake, WTP and OHSRs	Tree cutting	▪ Minimize removal of trees by adopting to site condition and with appropriate layout design of work sites ▪ Obtain prior permission for tree cutting ▪ Plant and maintain 5 trees for each tree that is removed	Contractor / cluster-PIUs/ PIU	PMU	Project Costs
Energy Efficiency	Loss of natural resources	▪ Use energy efficient electrical equipment Provision of use of energy efficient equipment in contract agreements and BOQ	Contractor / cluster-PIUs/ PIU	PMU	No cost required

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Responsible for monitoring	Cost and Source of Funds
Incorporating EMP and Health and Safety requirements into Contractor Bid Document	Implementation of the EMP	▪ The EMP should be included in the Bid Document so that the selected Contractor understands the issues and makes necessary plans to prepare and implement the EMP ▪ Health and safety requirements should be incorporated as part of the contract bid document so that the selected Contractor understands the issues and makes necessary plans to prepare and implement the health and safety requirements.	Contractor / cluster-PIUs/ PIU	PMU	Project Costs

Table 27: Pre-Construction Stage Environmental Impacts and Mitigation Measures

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Responsibility of Monitoring	Cost and Source of Funds
Legal compliance - Consents, permits, clearances, NOCs, etc.	Environmental legal non-compliance may attract legal actions Failure to obtain necessary consents, permits, NOCs etc. can result to design revisions and/or stoppage of works	▪ All necessary consents, permits, clearance, NOCs, etc. prior to award of civil works Must to be obtained ▪ All necessary approvals for construction will be obtained by contractor before start of construction ▪ It is acknowledged in writing and report on compliance of all obtained consents, permits, clearance, NOCs, etc. are provided. ▪ Detailed design drawings and documents are included.	Cluster-PIUs, PIU and PMSC	PMU	Cost of obtaining all consents, permits, clearance, NOCs, etc. prior to start of civil works responsibility of PIU./ Cluster- PIU
Environmental monitoring of baseline conditions of air, noise, water and soil	To establish base line environmental conditions	▪ Environmental monitoring through NABL approved laboratory	DBO Contractor	PMSC and PIU	Contractor
Location impacts of proposed components - project locations close to	Impact on sensitive areas (ASI monuments, and Ramsar wetland) due to proposed	▪ Obtain prior ASI permission for construction if required ▪ Prior to commencement of construction, consult with concerned religious authorities of these temples, nearby people and devotees and explain the work method and duration of proposed works,	DBO Contractor	PMSC and PIU	

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Responsibility of Monitoring	Cost and Source of Funds
protected monuments in Udaipur and close to Rudrasagar Ramsar Wetland in Melaghar	construction works	take their suggestions and comments in scheduling and conducting the works ▪ Prevent dust, noise, accumulated of water, and contaminated surface runoff from the work sites; take necessary measures as needed (these are presented in construction phase impacts-measures) ▪ No construction camps (workers accommodation, material / waste / soil storage) should be established within 500 m of the monuments in Udaipur ▪ No construction camps (workers accommodation, material / waste / soil storage) should be established within 1000 m (1 km) from the boundary of Rudrasagar lake; camps should not be located close to drainage lines/streams that flow into Rudrasagar lake ▪ All project related site staff, construction workers and supervisors, shall be made aware of the sensitive sites, and prevent any harm or damage or disturbance to trees, vegetation, wildlife, birds etc., ▪ Proper accommodation and facilities shall be provided within the camps, and workers shall not use the lake or surroundings for open defecation, bathing, or fishing / hunting, collecting firewood etc. Contractor should put in place, a proper system to monitor the staff and workers to prevent damage/ disturbance. ▪ Do not use equipment that generate heavy noise, ground vibration, dust etc., (such as pneumatic drills, dozers etc., within 100 m of temples, or within 500 m of Rudrasagar lake ▪ Schedule works during dry season to avoid contaminated runoff from the work sites entering lake; clear the sites of materials, debris, and			

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Responsibility of Monitoring	Cost and Source of Funds
		consolidated the refilled trenches prior to onset of monsoon ▪ Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; ▪ Place storage areas for fuels and lubricants away from any drainage leading to water bodies; ▪ Store fuel, construction chemicals etc., on an impervious floor, also avoid spillage by careful handling ▪ Dispose any wastes generated by construction activities in designated sites; and ▪ Conduct surface quality inspection according to the environmental management plan (EMP). ▪ Conduct continuous consultations with the local people during the works			
Utilities	Telephone lines, electric poles and wires, water lines within proposed project area	▪ Operators of these utilities have been preliminary identified and included in the detailed design documents to prevent unnecessary disruption of services during construction phase; ▪ (ii) provide prior notice (at least one week in advance) to affected areas ▪ DBO contractor will prepare and implement a contingency plan to include actions to be taken in case of unintentional interruption of services. ▪	Contractor in collaboration with Cluster-PIUs, and with approval of PMSC/ PIU	(i) PMSC and PIU	Project Cost
Construction work camps, stockpile areas, storage areas, and disposal areas.	Conflicts with local community; disruption to traffic flow and sensitive receptors	▪ Construction camp to be set up near major work site WTP, DTW and OHSRs ▪ If it is deemed necessary to locate elsewhere, consider sites that will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems; ▪ Do not consider residential areas; ▪ Extreme care will be taken in selecting sites to avoid direct disposal waste/ excess earth near	DBO Contractor	PMSC and PIU	Project Cost

Field	Anticipated Impact	Mitigation Measures	Responsibility of Mitigation	Responsibility of Monitoring	Cost and Source of Funds
		water body which may inconvenience the community. ▪ If required, for excess spoil disposal, (a) sites will be selected from barren, infertile lands. In case agricultural land selected, written consent will be taken from landowners; (b) debris disposal site will be selected 200 m away from surface water bodies; (c) no residential areas be located within 50 m downwind side of the site; and (d) site will be selected 100 m away from sensitive locations like settlements, ponds/lakes or other water bodies.			
Sources of Materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	▪ Construction materials are obtained only from government approved quarries with prior approval of cluster-PIUs/ PIU ▪ Cluster-PIUs ensured that quarry sources have all necessary clearances/ permissions in place prior to approval ▪ Contractor submits to PIU on a monthly basis documentation on material obtained from each source (quarry/ borrow pit) ▪ Creation of new borrow areas, quarries etc., to be avoided for the project (work is small); if unavoidable, contractor to obtain all clearances and permissions as required under law, including Environmental Clearance prior to approval by PIU	DBO Contractor	MSC and PIU	Project Cost
Physical Cultural resource	Chance finds	▪ Create awareness among the workers, supervisors and engineers about the chance finds during excavation work; ▪ Stop work immediately to allow further investigation if any finds are suspected; ▪ Inform local Archaeological Department / Museum office if a find is suspected and take any action, they require to ensure its removal or protection in situ	Contractor / cluster-PIUs/ PIU	PMU	Project Costs

Table 28: Construction Stage Environmental Impacts and Mitigation Measures

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
Environmental Management Plan (EMP) Implementation Training along with COVID 19 safety	Irreversible impact to the environment, workers, and community, Impact due to effect of COVID 19	▪ Project manager and all key workers will have undergone training on EMP implementation including spoils/waste management, Standard operating procedures (SOP) for construction works; occupational health and safety (OHS) including COVID-19(SOP), core labor laws, applicable environmental laws, etc.	DBO Contractor	PMSC and PIU	Project cost / PIU-PMU cost
Air Quality	Emissions from construction related vehicles, equipment, machinery, resulting to dusts and increase in concentration of vehicle related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons	**For all construction works** ▪ The soil and stockpiled material are damped down on site by water sprinkling ▪ Tarpaulins are used to cover the loose material (soil, sand, aggregate etc.,) when transported by trucks; ▪ A dust screen around the construction sites specifically at WTP, OHSRs site to be provided. Extra protection is required near sensitive receptors like school, Anganwadi, religious places located nearby the construction site. ▪ Wheels and undercarriage of haul trucks are cleaned prior to leaving construction site/quarry ▪ Sprinkling water and unloading inside the barricaded area will be made to Control dust generation while unloading the loose material (particularly aggregate, soil) at the site	DBO Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ Water is used to maintain soils in a visible damp or crusted condition for temporary stabilization ▪ Water to be used prior to leveling or any other earth moving activity to keep the soil moist throughout the process ▪ Tarpaulins are used to cover the soil stocked at the sites ▪ Access to be controlled to work area, preventing unnecessary movement of vehicle, public trespassing into work areas; limiting soil disturbance to minimize dust generation ▪ All construction equipment and machineries should be fitted with pollution control devices and have a valid pollution under control (PUC) certificate **Pipeline works** ▪ Barricading the construction area using barricade or use of caution tape ▪ Confine all the material, excavated soil, debris, equipment, machinery (excavators, cranes etc.,), to the barricaded/ demarcated area ▪ Limit the stocking of excavated material at the site; remove the excess soil from the site immediately to the designated disposal area ▪ Undertake the work section wise: 100 – 200 m section should be demarcated and barricaded			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ Conduct work sequentially - excavation, pipe laying, backfilling; conduct pipe testing section-wise (for a minimum length as possible) so that backfilling, stabilization of soil can be done. Minimize construction period near protected areas. ▪ Remove the excavated soil of first section to the disposal site; as the work progresses, sequentially, by the time second section is excavated, the first section will be ready for back filling, use the freshly excavated soil for backfilling, this will avoid stocking of material, and minimize the dust. ▪ Backfilled trench at any completed section after removal of barricading will be the main source of dust pollution. The traffic, pedestrian movement and wind will generate dust from backfilled section. Road restoration shall be undertaken immediately.			
Noise Levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people	▪ Activities to be planned in consultation with Cluster-PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; ▪ Horns will be not used unless it is necessary to warn other road users or animals of the vehicle's approach;	DBO Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ Vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers are used in construction equipment to minimize sound impact to surrounding sensitive receptor; ▪ Maximum sound levels to be maintained which not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s. ▪ Noise level should be controlled and below the standard near ASI protected areas and no construction will be allowed at night near the protected areas. ▪ Near school, Anganwadi, religious places and health center work need to be completed in shorter period. Noise generation should be restricted near the above sensitive receptors. Work should be carried out during day time only and non-school hours. ▪ Mitigate the sound from tube well drilling operation ▪ Local communities will be consulted in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals. ▪ Night time work will be avoided			
Construction Activity Near Rudrasagar	Disturbance to Local and Migratory birds	▪ Prepare SEMP before starting any work	DBO Contractor and PMSC / PIU	PMU	Cost for implementation of mitigation

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
Lake at Melaghar town		▪ No construction camps (workers accommodation, material / waste / soil storage) should be established within 1000 m (1 km) from the boundary of Rudrasagar lake; camps should not be located close to drainage lines/streams that flow into Rudrasagar lake ▪ Movement of workers and staff should be confined to work site, and not be allowed in wetland area which may disturb the sensitive area; ensure via strict supervision no poaching, fishing, cutting / damaging trees/vegetation or wildlife, birds etc., ▪ All project related site staff, construction workers and supervisors, shall be made aware of the sensitive sites, and prevent any harm or damage or disturbance to trees, vegetation, wildlife, birds etc., ▪ Proper accommodation and facilities shall be provided within the camps (at least 1 km away from the wetland), and workers shall not use the lake or surroundings for open defecation, bathing, or fishing / hunting, collecting firewood etc. Contractor should put in place, a proper system to monitor the staff and workers to prevent damage/ disturbance. ▪ Schedule works during dry season to avoid contaminated runoff from the work sites entering			measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		lake; clear the sites of materials, debris, and consolidated the refilled trenches prior to onset of monsoon ▪ Implement sediment and erosion control measures to prevent soil erosion and sedimentation in the wetland. Prevent entry of silt-laden / contaminated runoff into wetland or drains leading to wetland from the construction sites or construction camps. Appropriate measures such as silt traps, sedimentation ponds, and filtration systems should be installed to prevent sediment and other pollutants from entering the water supply. Soil stabilization measures should also be taken to prevent soil erosion during construction, Construction near wetland to be planned in dry seasons only. ▪ Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; ▪ Place storage areas for fuels and lubricants away from any drainage leading to water bodies; ▪ Store fuel, construction chemicals etc., on an impervious floor, also avoid spillage by careful handling ▪ Do not use equipment that generate heavy noise, ground vibration, dust etc., (such as pneumatic drills, dozers etc), within			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		500 m of Rudrasagar lake. Adapt manual excavation as far as possible ▪ Construction sites often generate significant amounts of dust that can impact nearby habitats. Dust suppression measures, such as watering down exposed soil, can help to reduce dust levels. ▪ Dispose any wastes generated by construction activities in designated sites; and ▪ Monitor the project closely throughout construction to ensure that all mitigation measures are being implemented effectively and that any issues are identified and addressed promptly. ▪ Conduct surface quality inspection according to the environmental management plan (EMP). ▪ Conduct continuous consultations with the local people during the works			
River Intakes (at Udaipur)	Water quality and ecological impacts	▪ Select a construction methodology that is least disturbing, and appropriate for the in-situ soil condition, and able to complete the construction work prior to onset of monsoon. ▪ Schedule the construction works during low water level period – late winter months to pre monsoon (November - March); ensure that works are completed	PIU	PMU	Project Costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		during the same period to prior to onset of monsoon; ▪ Erect temporary barriers to form enclosed construction area with least disturbance ▪ Allow adequate time to settle the distributed solids to prior to pumping out water; only clear/clarified water shall be pumped back into the reservoir; any silt laden water should be pumped to a silt pond ▪ Avoid/minimize use of fuels, chemicals and lubricants; ensure no spillage ▪ Clear the work site after completion at least to pre project conditions, ensure that there are no materials, debris, spills etc., and prior to removal of temporary barriers ▪ Implement work site safety at works in water body			
Surface water quality	Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during construction can contaminate nearby surface water quality. Ponding of water in the	▪ All earthworks to be conducted during the dry season to prevent the problem of soil run-off during monsoon season; ▪ Ensure that no excavation or ground breaking activities are conducted during the rains; ▪ Clear the sites of materials and wastes before the onset of monsoon; do not block or divert or damage any channels, surface drainage lines; ensure that any blocks are cleared, and runoff is allowed to flow downstream.	DBO Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
	pits/foundation excavations	▪ Stockpiling of earth fill especially during the monsoon season will be avoided unless covered by tarpaulins or plastic sheets; ▪ Excess spoils and debris will be re-used in the construction works. Only designated area, if required, will be used for soil disposal ▪ Install temporary silt traps or sedimentation basins ▪ Storage areas for fuels and lubricants will be selected away from any drainage leading to water bodies. ▪ Fuel, construction chemicals etc., will be stored on an impervious floor, also spillage is avoided by careful handling ▪ Construction wastes to be disposed in designated sites; ▪ Temporary drainage channels will be created around the work area to arrest the entry of runoff from upper areas into the work area ▪ The water collected in the pits / excavations will be pumped to a temporary sedimentation pond; dispose of only clarified water then dispose into drainage channels / streams after sedimentation in the temporary ponds ▪ Safety aspects will be considered related to pit collapse due to accumulation of water			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ During construction of intake river bed earth needs to be removed quickly to control turbidity in the river water ▪ During construction of tube well – waste water generate from construction activity will be channelized to pit and later muck will be collected from the pit for disposal ▪ During development of tube well, waste water will be drained to nearby *nallaha* ▪ Conduct surface quality inspection according to the EMP. ▪ Implement measures to protect water quality in the wetland for Melaghar MC. Include measures such as installing sediment traps, using biodegradable lubricants, and minimizing the use of chemicals. ▪ Implement sediment and erosion control measures to prevent soil erosion and sedimentation in the wetland. This can include measures such as silt fences, sediment			
Ground Water Quality	Contamination of ground water quality due to spillage of oil and lubricants	▪ Prepare and implement a spills management plan; ▪ Provide impermeable liner on the ground and place layer of mortar or concrete over it in the oil and lubricants storage areas, provide spillage trap in oil and lubricant store, use dip tray and pump to pour oil from oil and lubricant drums;	DBO Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ Dispose any oil contaminated wastes generated by construction activities in scientific manner; and ▪ Conduct ground water quality monitoring according to the EMP			
Waste and debris management	Impacts due to excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty paint containers, spoils, oils, lubricants, and other similar items.	▪ Prepare plan for disposal of construction and demolition waste including excavated earth in the designated site/sites and submit the plan in PIU for approval ▪ As far as possible the debris and excess soil will be utilized in construction purpose, for example for raising the ground level or construction of access roads etc. ▪ Avoid stockpiling any excess spoils at the site for long time. Excess excavated soils should be disposed at approved designated areas immediately, ; ▪ Do not store any construction materials and spoil materials nearby the sensitive receptors; ▪ Construction waste shall not be disposed near the sensitive receptors like school, Anganwadi and religious places ▪ No disposal of construction wastes near 1 km from protected wetland and ASI protected sites; ▪ Muck from construction activity of tube well will be disposed in designated area after receiving of NOC	DBO Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ Stockpiles, lubricants, fuels, and other materials will be located away from steep slopes and water bodies; ▪ For disposal, the site selected will be preferably from barren, infertile lands; site would be located away from residential areas, forests, water bodies and any other sensitive land uses; ▪ Domestic solid wastes will be properly segregated into biodegradable and non-biodegradable for collection and disposal to designated solid waste disposal site; compost pit to be created at workers' camp sites for disposal of biodegradable waste; non-biodegradable / recyclable material will be collected separately and sold in the local recycling material market; ▪ Residual and hazardous wastes such as oils, fuels, and lubricants to be disposed of through approved vendors of Pollution Control Board; ▪ Burning of construction and/or domestic waste are prohibited; ▪ Wastes will be not haphazardly dumped/ thrown within and around the project site and adjacent areas; proper collection bins to be provided, and awareness to be created to use the dust bins.			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ Site clearance and restoration will be done immediately after the completion of construction work to restore to the original condition; cluster-PIU ensures that site is properly restored prior to issuing of construction completion certificate.			
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure at specified project location	▪ Prepare a list of affected utilities and operators if any; and ▪ Prepare a contingency plan to include actions to be done in case of unintentional interruption of service	DBO Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.
Ecological Resources Terrestrial	Loss of vegetation and tree cover	▪ Minimize removal of vegetation and disallow cutting of trees; ▪ If tree-removal will be required, obtain tree-cutting permit and ▪ Plant 5 native trees for every one that is removed.	DBO Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.
Accessibility	Traffic problems and conflicts near project locations and haul road Impact on access to house and road user particularly during laying of pipes	**Hauling (material, waste/debris and equipment) activities** ▪ Transportation routes to be planned so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites ▪ Transport and hauling activities will be scheduled during non-peak hours; ▪ Entry and exit points will be in areas where there is low potential for traffic congestion;	DBO Contractor	PMSC and PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ Vehicles to be driven in a considerate manner ▪ Affected public will be notified by public information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints. ▪ Separate demarcated access will be temporarily arranged for nearby sensitive receptors like school. Anganwadi, religious places & health center located adjacent to the proposed construction areas. **Pipeline works** ▪ Confine work areas along the roads to the minimum possible extent; all the activities, including material and waste/surplus soil stocking should be confined to this area. Proper barricading should be provided; avoid material/surplus soil stocking in congested areas – immediately removed from site/ or brought to the as and when required ▪ Leave spaces for access between mounds of soil to maintain access to the houses / properties ▪ Provide pedestrian access in all the locations; provide wooden/metal planks over the open trenches at each house to maintain the access. ▪ Inform the affected local population 1-week in advance about the work schedule			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ Avoid work during day time when community facilities such as educational institutes, healthcare centres, religious places, markets will be operating. Also provide alternative access. ▪ Plan and execute the work in such a way that the period of disturbance/ loss of access will be minimum. ▪ Keep the site free from all unnecessary obstructions; ▪ Coordinate with Traffic Police for temporary road diversions, where necessary, and for provision of traffic aids if transportation activities cannot be avoided during peak hours			
Socio-Economic – Income.	Impede the access of residents and customers to nearby shops	▪ Prepare and implement spoils management plan . Contractor to Implement RP and to follow mitigation measures prescribed such as- ▪ Leave spaces for access between mounds of soil; ▪ Provide walkways and metal sheets where required for people; ▪ Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools; ▪ Consult businesses and institutions regarding operating hours and factoring this in work schedules; and	DBO Contractor	PMSC and PIU	Contractor costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.			
Socio-Economic - Employment	Generation of temporary employment and increase in local revenue	▪ Employ local labor force as far as possible; and ▪ Comply with labor laws (See Error! Reference source not found. of this IEE)	DBO Contractor	PMSC and PIU	Cost for Implementation of mitigation measures responsibility of contractor.
Occupational Health and Safety	Occupational hazards which can arise during work, safe from COVID 19	▪ All national, state and local core labor laws to be complied with (see Error! Reference source not found. of this IEE). Labour license and Workmen Compensation policy to be obtained by contractor before start of construction ▪ Develop and implement site-specific occupational health and Site-specific occupational health and safety (OHS) Plan and Supplementary H & S plan for COVID 19 to be developed and implemented (Appendix 12 shows COVID 19 SOP guideline) which included measures such as: excluding public from the site; ▪ maintaining social distancing for protection from COVID 19 infection; ▪ ensuring all workers are provided with and use personal protective equipment like helmet, gumboot, safety belt, gloves, nose mask, face mask and ear plugs;	DBO Contractor	PMSC and PIU	Cost for Implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ OHS Training and COVID 19 awareness H & S training for all site personnel; ▪ complete COVID 19 vaccinations for workers, ▪ documented procedures to be followed for all site activities including follow of SOP for COVID 19 to be developed for the project and H & S plan; and ▪ documentation of work-related accidents; ▪ Availability of First aid box/ facility throughout the project period; ▪ Medical insurance and tie-up with local hospitals to be provided for workers; ▪ All installations will be secured from unauthorized intrusion and accident risks; ▪ Potable drinking water to be provided for the workers; ▪ Clean eating areas to be provided where workers are not exposed to hazardous or noxious substances; ▪ To provide health and safety orientation training including COVID 19 risk and mitigation to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; ▪ Visibility of workers to be ensured through the use of high			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		visibility vests when working in or walking through heavy equipment operating areas; ▪ Moving equipment will be outfitted with audible back-up alarms; ▪ Sign boards will be provided for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage is in accordance with international standards and are well known to, and easily understood by workers, visitors, and the general public as appropriate; ▪ Workers will be disallowed exposure to noise level greater than 85 dB (A) for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively. ▪ Standard Operating Procedure (SOP) for the project and Supplementary H & S plan for COVID 19 will be prepared which cover, ▪ General instruction to follow to prevent the spread of COVID-19 in construction workplace ▪ Worksite prevention practice at work site, office, during meeting, travelling, etc. ▪ Precaution to be taken at workmen habitat/ camp			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ Use of PPEs: face mask – hand gloves, maintaining social distancing, disinfection, requirement of awareness covered under the H & S plan.			
Community Health and Safety.	Erosion, land slides / slips during rains; traffic accidents and vehicle collision with pedestrians during material and waste transportation and pipe laying work	▪ Ensure that no excavation or ground breaking activities are conducted during the rains; ▪ Clear the sites of materials and wastes before the onset of monsoon; do not block or divert or damage any channels, surface drainage lines; ensure that any blocks are cleared, and runoff is allowed to flow downstream. ▪ Any disturbed surfaces are properly consolidated, and erosion risk must be eliminated. ▪ Places where trees/vegetation is cleared for works, ensure proper consolidation and/or protection prior to onset of monsoon ▪ Monitor newly cut/filled surfaces, and take necessary measures to prevent soil erosion ▪ Movements of construction vehicles are restricted to defined access roads and demarcated working areas (unless in the event of an emergency) ▪ strict speed limit (20-30 kmph) is enforced for plying on unpaved roads, construction tracks ▪ Night-time haulage is by exception only, as approved by the	DBO Contractor	PMSC and PIU	Cost for Implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		cluster-PIU to minimize driving risk and disturbance to communities ▪ Safe practices are adopted for micro tunneling- (in case of major road crossing) ▪ Temporary traffic control (e.g. flagmen) and signs will be provided where necessary to improve safety and provide directions ▪ Restrict speed of the vehicle and equipment near sensitive receptors ▪ Separate barricading needs to be provided near adjacent sensitive receptors like school, Anganwadi, health center and religious places; ▪ All drivers should pass through safety and training sessions ▪ Public access will be restricted using barricade and security personnel at pipe laying work locations ▪ Warning signs, blinkers will be attached to the barricading to caution the public about the hazards associated with the works, ▪ The period of time when the pipeline trench is left open will be minimized through careful planning ▪ Control dust pollution –dust control measures will be implemented as suggested under air quality section ▪ Vehicles will be regularly maintained and manufacturer-approved parts will be used to minimize potentially serious			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		accidents caused by equipment malfunction or premature failure. Road signs and flag persons will be there to warn of on-going trenching activities. ▪ Road signs and flag persons will be provided to warn of on-going trenching activities.			
Safety of sensitive groups (children, elders etc.) and others pedestrians in narrow streets	Trench excavation in narrow streets will pose high risk to children and elders in the locality	▪ Provide prior information to the local people about the nature and duration of work ▪ Conduct awareness program on safety during the construction work ▪ Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day ▪ Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches ▪ Implement additional safety features for working near the schools; isolate work site from the school access road; provide proper barricading to prevent entry of children / public into work site; create awareness among school children and staff on construction safety	DBO Contractor	PMSC and PIU	Cost for Implementation of mitigation measures responsibility of contractor.
Work Camps and worksites	Temporary air and noise pollution from	▪ Camp site will be established near major construction i.e WTP, OHSRs site	DBO Contractor	PMSC and PIU	Cost for Implementation of mitigation

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
	machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants. Unsanitary and poor living conditions for workers	▪ No worker's camp is allowed near (within 1 km) Wetland area (Rudrasagar lake) at Melaghar ▪ No Tree will be cut for settling of camp. ▪ Camp site will not be located near (100 m) water bodies, flood plains flood prone/low lying areas, or any ecologically, socially, archeologically sensitive and protected areas ▪ The workers living areas and material storage areas will be separated clearly ▪ Proper temporary accommodation with proper materials, adequate lighting and ventilation to be provided, appropriate facilities will be provided for winters and summers; conditions of livability at work camps should be ensured and maintained at the highest standards possible at all times; ▪ Cluster-PIU should be consulted before locating project offices, sheds, and construction plants; ▪ Removal of vegetation is minimized and cutting of trees disallowed without permission from concerned authorities ▪ Camp should be protected from COVID 19 health risk. All Health and safety procedure to be followed for operation of camp (H & S plan for COVID 19 will be used as			measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		ref. document) during stay, cooking, eating, use of toilet- common space etc. ▪ Self- hygiene, regular disinfection of entire camp and toilet, maintaining of social distancing to be continued for protection from COVID 19 infection ▪ Unknown person will be not allowed within the camp ▪ Camps will be provided with proper drainage, without any water accumulation ▪ Maintenance of hygienic environment at staying area, cooking area and toilet ▪ Drinking water, water for other uses, and sanitation facilities for employees to be provided ▪ Employees will be prohibited from cutting of trees for firewood; contractor provided proper facilities including cooking fuel (oil or gas; fire wood not allowed) ▪ Employees will be trained in the storage and handling of materials which can potentially cause soil contamination ▪ Used oil and lubricants will be recovered and removed from the site ▪ Solid waste to be managed according to the following preference hierarchy: reuse, recycling and disposal to designated areas; provide a compost pit is provided for			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		biodegradable waste, and non-biodegradable / recyclable waste are collected and sold in local market ▪ All wreckage, rubbish, or temporary structures which no longer required should be removed ▪ At the completion of work, camp area will be cleaned and restored to pre-project conditions, and report will be submitted to Cluster-PIU; they will review and approve camp clearance and closure of work site ▪ Guideline for worker's camp attached as **Appendix 12.**			
Impacts due to night works (if required as per nature of works and feasibility at site)	Occupational hazards which can arise during work at night in extreme and unavoidable cases	▪ Preferably electrical connections are available for running equipment's otherwise sound proof/super silent Diesel Generator set should be available ▪ Sound level should not increase as per EMP ▪ Illumination should be adequate as required according to nature of works ▪ As far as possible ready-mix concrete from batching plant to be used, otherwise the concrete should be prepared away from residential areas and brought to the site ▪ All the noise activity like hammering, cutting, crushing, running of heavy equipment's should be done in day time and avoided in night time	DBO Contractor	PMSC and PIU	Cost for Implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ Workers engaged in night works should have adequate rest/sleep in day time before start of night works ▪ Worker engaged for night works should have previous experience of night works and should be physically fit for such works including clear vision in night ▪ All the necessary provisions of traffic aids such as traffic signals, road signage, barricades, cautions boards, traffic diversion boards etc. should be available with fluorescent /retro-reflective arrangements ▪ Workers should be trained before start of night works about risks and hazards of night works and their mitigation measures and should be provided all the protective aids (PPEs) including fluorescent/retro-reflective vests ▪ Horns should not be permitted by equipment and vehicles ▪ Workers should not shout and create noise ▪ First aid and emergency vehicles should be available at site ▪ Emergency preparedness plan should be operative during night works ▪ Old persons and pregnant women and women having small kids should not work in night time ▪ All the vehicles and equipment being used at night			

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		works should have adequate type of silencers/enclosures/mufflers to reduce noise ▪ All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night work. ▪ Management Plan for night works is attached in Error! Not a valid result for table.			
Social and Cultural Resources	Risk of archaeological chance finds Works near local religious / cultural places may inconvenience local community	▪ During the detailed design, PIU to consult ASI (in Udaipur / Agartala) with exact distance and depth of waterlines works within 300 m of the monuments, and include any feedback or measures as suggested by ASI in into design/construction; obtain prior ASI permission for construction if required ▪ Prior to commencement of construction, consult with concerned religious authorities of these temples, nearby people and devotees and explain the work method and duration of proposed works, take their suggestions and comments in scheduling and conducting the works ▪ No construction camps (workers accommodation, material / waste / soil storage) should be established within 500 m of the monuments in Udaipur ▪ Do not use equipment that generate heavy noise, ground vibration, dust etc., (such as	DBO Contractor	PMSC and PIU	Cost for Implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		pneumatic drills, dozers etc., within 100 m of ASI monuments ▪ Put in place proper dust and noise control measures ▪ Adjacent to religious/social/historical buildings, undertake excavation and construction work in such a way that no structural damage is caused to the structures ▪ Observe the local rituals and important dates of festivals, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrance/obstacles during such time to the religious places ▪ Provide proper signage, barricades etc. to protect public and devotees from dangers of construction works. ▪ Ensure proper traffic management planning to minimize the disruption to the normal traffic flow in the area and ensure the safety of the people. ▪ Clear the work site of unnecessary material, equipment and debris / surplus soil; do not stock material / soil at the sites ▪ Conduct continuous consultations with the local people during the works			
Monsoon preparedness	Disruption of utilities and	▪ As for a possible avoid trench works and excavation works (pipe laying) during monsoon	DBO Contractor	PMU	Cost for Implementation of mitigation

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
	water logging in trenches	season to avoid any water logging and accident due to it ▪ if open trenches are not avoidable during monsoon, keep ready all the mitigations measure to avoid water logging such as dewatering pumps and sufficient pipes, traffic assistance, barricades etc. ▪ Guidelines for safety during monsoon is attached as **Appendix 15.**			measures responsibility of contractor.
Submission of EMP implementation report	Unsatisfactory compliance to EMP	▪ Appointment of Environment, Health, and Safety (EHS) Supervisor to ensure EMP implementation ▪ Timely submission of monitoring reports including pictures	DBO Contractor	PMU	Contractor cost
Post-construction clean-up	Damage due to debris, spoils, excess construction materials	▪ Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) after completion of work; ▪ All excavated roads shall be reinstated to original condition. ▪ All disrupted utilities will be restored ▪ All affected structures will be rehabilitated/ compensated ▪ The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up. ▪ The contractor must arrange the cancellation of all temporary services.	DBO Contractor	PMU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
		▪ Request Cluster-PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.			

Table 29: Operation Stage Environmental Impacts and Mitigation Measures

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
WTP and intake operation – malfunction and effect on efficiency (at Udaipur)	Public health, safety and environmental impacts	▪ Operate as per the Operational Manual following Standard Operating Procedures as per the WTP design ▪ Undertake preventive and periodic maintenance activities as required ▪ Ensure periodic training to staff in WTP, intake operation, especially in chemical handling and dosing, filter backwash, etc., ▪ Replace pumps, motors and other parts as per the operating life prescribed by manufacturer ▪ Maintain the mechanical parts as per the maintenance plan to avoid any hazards ▪ Ensure that all safety apparatus at WTP, intake including personal protection equipment is in good condition all times; and are at easily accessible and easily identifiable place; periodically check the equipment, and conduct mock drills to deal with emergency situations ▪ Ensure that backwash recirculation system and sludge management system are operated as per the manual	Operator/DBO contractor	PMU	Operating costs
Existing WTPs	Environment and health impacts	▪ Ensure WTPs are delivering water quality meeting drinking water standards (IS 10500-2012) ▪ Ensure that backwash water and sludge is managed properly; no untreated discharge/disposal into environment ▪ Ensure proper chemical handling, overall housekeeping, and health and safety practices	Operator / DWS	PMU	Operating costs
Operation of DTW & IRP, pumping of water (Bishramganj and Belonia)	Public health, safety and environmental impacts • Over abstraction of groundwater through tube well resulting land subsidence • Contaminated	▪ Over pumping should be avoided. ▪ Conduct water quality monitoring at strategic points in the distribution system ▪ Ensure standard water quality (surveillance procedures and protocols as a key obligation of the contractor with third party checks ▪ Nearby polluted sources should be checked and avoided.	Operator/DBO contractor	ULB- MC	Operating costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
	groundwater from nearby polluted sources • Noise from pumping will be nuisance to surrounding receptors	▪ Maintain the mechanical parts as per the maintenance plan to avoid any hazards ▪ Follow MoUD's CPHEEO Manual on Operation and Maintenance of Water Supply Systems ▪ Prevent, minimize, and control potential impacts associated with the storage, handling and use of disinfection chemicals ▪			
Check for blockage and leakage problems reducing the water losses	Loss of water, increased demand and inconvenience to consumers and general public	▪ Effectiveness of leak detection and water auditing to reduce the water losses	Operator/DBO contractor	ULB-MC	Operating costs
Monitoring of Plantation	Loss of Trees	▪ Monitoring of survival of trees should be done at regular interval and suitable mitigation measures should be taken to protect the trees. ▪ Efforts will be made for proper maintenance of planted trees, shrubs and grasses to maintain greenery and aesthetics ▪ Planted tree should be covered with fence or net	Operator/DBO contractor	PMU	Operating costs
Construction disturbances, nuisances, public & worker safety	All work sites	▪ Implementation of dust control, noise control, traffic management, & safety measures. ▪ Extra precaution to be taken during any repairing work near sensitive receptors. All mitigation measures as mentioned in construction phase, same will be applicable for O & M phase. ▪ Site inspection checklist to review implementation is appended at Error! Reference source not found.	Operator/DBO contractor	ULB-MC	No cost required
Achieving targeted sludge reuse	Violation of ULB commitment under the project. Moreover, o land has been identified for safe sludge disposal. Hence, it is imperative	▪ Ensure that the targeted sludge reuse is achieved throughout the project period	Operator/DBO contractor	ULB-MC	O&M Contractor

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
	to achieve the targeted sludge reuse under the project.				
Routine maintenance of WTP DTW, IRP, OHRs and other facilities to ensure delivery of safe drinking water	Health impact due to supply of unsafe drinking water in the system	▪ Ensure periodical maintenance and cleaning of OHSRs, DTW, IRP, WTP for delivery of safe drinking water Periodical testing of treated water to ensure treated water quality meets the required standards	Operator/DBO contractor	ULB- MC	O&M Contractor
Occupational health and safety	Health, social and economic impacts on the workers	▪ Provide appropriate PPE and training on its proper use and maintenance. ▪ Provide specific training on COVID 19 issues and availability of relevant specific PPEs for protection (COVID 19 H & S plan as ref material) ▪ Strictly follow H & S protocol as developed for COVID 19 pandemic ▪ Use fall protection equipment when working at heights. ▪ Maintain work areas to minimize slipping and tripping hazards. ▪ Implement a training program for operators who work with chlorine regarding safe handling practices and emergency response procedures. Prepare escape plans from areas where there might be a chlorine emission. ▪ Install safety showers and eye wash stations near the chlorine equipment and other areas where hazardous chemicals are stored or used. ▪ Prohibit eating, smoking, and drinking except in designated areas. ▪ Guidelines for safety for Chlorine usage attached in **Appendix 7**	Operator/DBO contractor	ULB- MC	Operating costs
Asset management	Reduction in NRW Increased efficiency of the system	▪ Preparation and implementation of O&M Manual	Operator/DBO contractor	PMU	To be identified

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Cost and Source of Funds
Increased in sewage generation	Water pollution, and impacts on public health and environment	▪ Sanitation and sewerage/septage facilities needs to be improved/provided in the project area to suit the increased sewage generation ▪ Under AMRUT/ similar and Tripura Govt. State fund interception of wastewater from drain and treatment in the STP and in-situ treatment of nalla water has been planned. Major drains running the core area of the town with enhance load are identified for interception and diversion to the proposed STP site. Work will be commenced very soon.	ULB- MC	PMU	To be identified

Table 30: Construction Stage Environmental Monitoring Plan

Monitoring field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility	Monitoring	Cost and Source of Funds
Surface water	Rudrasgar wetland, Gomati River and Muhuri River (intake, WTP inlet and WTP outlet)	pH, TDS, Oil and grease, Cl, F, NO3, TC, FC, Hardness, Turbidity BOD, COD, DO, Total Alkalinity, including other essential parameters as per drinking water standards IS 10500-2012	Once during detailed design for assessment of WTPs	DBO Contractor	PMSC and PIU	Project costs
Groundwater	All five towns – selected DTWs	Essential parameters as per drinking water standards IS 10500-2012	Once during detailed design for assessment of WTPs	DBO contractor	PMSC and PIU	Project costs

Monitoring field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility	Monitoring	Cost and Source of Funds
Construction disturbances, nuisances, public and worker safety,	All work sites	Implementation of dust control, noise control, traffic management, and safety measures. Site inspection checklist to be developed	Weekly during construction	Supervising staff and safeguards specialists	PMSC, PIU and ULB	No costs required
Tree cutting	WTP, Pipe laying, construction/ labour camps site	Tree cutting permit taken, Tree cutting done	Continuous	Supervising staff, EHS officer and safeguards specialists	PMSC, PIU and ULB	Contractor
Construction, Labour Camp, storage yard Management	Construction, Labour Camp, storage yard sites	As per SEMP	Weekly	EHS officer, Environment Specialist of consultant	PMSC, PIU and ULB	contractor
Solid waste management	Construction, Labour Camp, storage yard Management	As per SEMP	Weekly	EHS officer, Environment Specialist of consultant	PMSC, PIU and ULB	contractor
Construction and demolition waste management	All construction site	As per SEMP and applicable rules and regulations	Monthly	EHS officer, Environment Specialist of consultant	PMSC, PIU and ULB	contractor
Consent to establish of batching plants, crusher, hot mix plant. DG sets etc.	Batching plants, crusher, hot mix plants etc.	Copies of Consents	Periodically	EHS officer, Environment Specialist of consultant	PMSC and PIU	No cost required for monitoring cost for obtaining CTE/CTO from PMU

Monitoring field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility	Monitoring	Cost and Source of Funds
						and for others from Contractor
Ambient air quality	**Udaipur** 3 locations, (WTP, OHSR and pipe line) critical areas (ASI monuments) **Amarpur** 2 locations along pipeline (covering sensitive area) **Bishramganj** 3 locations, (OHSR and pipe line) **Melaghar** 3 locations, (OHSR- and pipe line), one point close to Rudrasagar lake / Raj Ghat **Belonia** 3 locations, (OHSR, DTW and pipe line)	PM_{10}, $PM_{2.5}$ NO_2, SO_2, CO	(i) Once before start of construction. (ii) Yearly 3 times (for seasons: pre-monsoon, post-monsoon and winter) during construction (2.5-years period considered)	DBO Contractor	PMSC and PIU	Cost for implementation of monitoring measures responsibility of contractor
Ambient noise	**Udaipur** 3 locations, (WTP, OHSR and pipe line) critical areas) (ASI monuments) **Amarpur** 2 locations along pipeline (covering sensitive area) **Bishramganj** 3 locations, (OHSR and pipe line) **Melaghar** 3 locations, (OHSR- and pipe line) one point close to Rudrasagar lake / Raj Ghat **Belonia** 3 locations, (OHSR, DTW and pipe line)	Day time and nighttime noise levels	(i) Once before start of construction. (ii) Yearly 3 times (for seasons: pre-monsoon, post-monsoon and winter) during construction (2.5-years period considered)	DBO Contractor	PMSC and PIU	Cost for implementation of monitoring measures responsibility of contractor

Monitoring field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility	Monitoring	Cost and Source of Funds
Surface water quality	**Udaipur** One location (River intake point) 1 – if required (suspected river contamination) Melaghar, Amarpur, Bishramganj and Belonia 1 – if required (suspected surface water river contamination)	pH, TDS, Oil and grease, Cl, F, NO3, TC, FC, Hardness, Turbidity BOD, COD, DO, Total Alkalinity	(i) Once before start of construction (ii) Yearly 3 times (for seasons: pre-monsoon, post-monsoon and winter) during construction (2.5-years period considered)	DBO Contractor	PMSC and PIU	Cost for implementation of monitoring measures responsibility of contractor

Table 31: Operation Stage Environmental Monitoring Plan

Monitoring Field	Monitoring Location	Monitoring Parameters	Frequency	Responsibility	Monitoring	Cost and Source of Funds
Monitoring of quality of water supplied to consumers	Consumer end- random sampling in all zones	pH, Nitrite, Nitrate, Turbidity BOD, Total Alkalinity, Total coliform and Faecal coliform	Quarterly once	Contractor / ULB	ULB/ DWS	O&M costs (water quality will be tested at the internal laboratory part of WTP)
Monitoring of quality of River water (Udaipur)	Intake location	pH, TDS, Oil and grease, Cl, F, NO3, TC, FC, Hardness, Turbidity BOD, COD, DO, Total Alkalinity pesticides, heavy metals	Monthly once	Contractor / ULB	ULB	O&M costs (water quality will be tested at the internal laboratory part of WTP)
Source water quality (Bishramganj and Belonia)	On DTW locations	pH, Cl, F, NO3, TC, FC, Hardness, Turbidity BOD, COD, DO, Total Alkalinity, heavy metals and pesticides	Yearly twice (pre and post monsoon)	Contractor / ULB	ULB	O&M costs
Sludge quality and suitability as manure	WTP	Analysis for concentration of heavy metals and confirm that value is within the following limits (all units are in mg/kg dry basis except pH) Arsenic - 10.00 Cadmium - 5.00 Chromium - 50.00 Copper - 300.00 Lead - 100.00 Mercury - 0.15 Nickel - 50.00 Zinc - 1000.00 PH - 5.5-8.5	Half-Yearly once	Contractor / ULB	ULB	O&M costs (testing to be done at an accredited external laboratory)

B. Implementation Arrangements

182. Urban Development Department (UDD) of Government of Tripura (GOT) is the executing agency, and the implementing agencies are Tripura Urban Planning and Development Authority (TUDA, for urban component) and Tripura Tourism Development Corporation Limited (TTDCL, for tourism component). A Project Management Unit (PMU) will be established with the secretary, UDD as the project director and secretary, Department of Tourism (DOT), GOT, as co-project director. The PMU will also include two additional project directors (one each for urban and tourism), a project coordinator, and an additional project coordinator. Six project implementation units (PIUs) will be established to cover urban and tourism components separately and will be located at Agartala, Udaipur and Kumarghat. Project Management & Supervision Consultant (PMSC) will be engaged to assist PMU and the PIUs for project implementation of the project.

183. At PMU, the project coordinator at PMU will be the nodal officer for environmental, social safeguards and gender and will be responsible for ensuring compliance with ADB's Safeguards Policy Statement (SPS), 2009, during the project implementation, including the monitoring and reporting. PMU will engage a qualified and experienced consultant, designated as environmental safeguards officer (ESO), to support project coordinator in environmental safeguards tasks. Project manager or assistant project manager of PIU will be designated as safeguards focal in each PIU. PMSC team will include an Environmental Safeguards Specialist (ESS), and three support safeguards staff, located in PIUs and will provide all necessary support and expert guidance to PMU and PIUs. The contractor will appoint an Environment, Health and Safety (EHS).

184. **Project Management Unit (PMU).** The PMU will be responsible for planning, management, coordination, supervision and progress monitoring. The PMU has the responsibility of fulfilling environmental requirements of the government and ensuring effective implementation of the environmental management provisions in the IEEs, EMPs and civil works contracts. The following are the key environmental safeguard tasks and responsibilities of the ESO at the PMU:

(i) ensure project compliance with the statutory environmental requirements, ADB SPS 2009, and loan covenants
(ii) ensure that draft IEEs prepared based on preliminary designs are updated to reflect the final subproject detailed designs, and are approved by ADB and disclosed prior to bid invitation (for works contracts) and commencement of works (for design-build contract)
(iii) ensure that IEEs including EMPs are included in bidding documents and contracts
(iv) Ensure that baseline monitoring as suggested in the EMPs are conducted and base values established prior to commencement of works
(v) Ensure that detailed environmental audit conducted for existing facilities and corrective actions are included in project for implementation
(vi) coordinate with design engineers to avoid potential environmental impacts
(vii) ensure that SEMPs are submitted by contractor and cleared by PIU prior to commencement of works
(viii) ensure that construction works are not commenced until all applicable government clearances, permits (including those required by construction contractor) are obtained;
(ix) Oversee and ensure that contractors and their subcontractors comply with labor laws and rules

(x) ensure that the IEEs including EMPs are updated in case of any change project scope, design or location during implementation
(xi) confirm compliance with all measures and requirements set forth in the IEEs, the EMPs and any corrective or preventive actions set forth in safeguard monitoring reports;
(xii) finalize environmental sections quarterly progress reports, and environmental monitoring reports for submission to ADB
(xiii) ensure availability of budget for safeguards activities
(xiv) ensure adequate awareness campaigns, information disclosure among affected communities and timely disclosure of final IEEs/EMPs and SEMRs, including corrective action plans, if any, in project website and in a form accessible to the public;
(xv) assist in setting up of grievance redress mechanism (GRM), identifying grievance redressal committee (GRC) members and developing capacity of GRC members, PIUs, consultants, and contractors in addressing environmental safeguards-related issues/concerns/complaints;
(xvi) ensure any grievances brought about through the GRM are redressed in a timely manner;
(xvii) organize periodic capacity building and training programs on safeguards for PMU, PIUs and contractors.

185. **Project Implementation Units.** The PIUs will be responsible for the day-to-day activities of project implementation in the field and will have direct supervision of all contractors. PIUs will oversee and monitor the day-to-day progress and implementation including environmental safeguards. The following are the key environmental safeguard tasks and responsibilities of the SO safeguards focial at the PIU with the PMDC's support environmental engineer:

(i) Promptly report to PMU on any changes in project design / location / scope during the design verification and implementation phase and coordinate with PMC to update IEEs and EMPs
(ii) Liaise with local offices of regulatory agencies and ensure that clearances /approvals are obtained timely;
(iii) Take necessary action for obtaining right-of-way prior to start of works;
(iv) Review and approve contractor SEMPs;
(v) Oversee implementation of SEMPs by contractors
(vi) Ensure that contractors and their subcontractors comply with labor legislations and standards; ensure that workers are accommodated, paid and treated according to the requirements
(vii) ensure strict implementation of occupational health and safety requirements
(viii) Review monthly reports from contractors on EMP implementation, and support PMU in preparing quarterly reports and SEMRs
(ix) Ensure continuous public consultation and awareness;
(x) Coordinate grievance redress process and ensure timely actions by all parties; and
(xi) Support all other environmental safeguards-related activities and tasks of the PMU as may be needed.
(xii) recommend issuance of construction work completion certification to the contractor upon verification of satisfactory post-construction clean-up.

186. **Project Management and Supervision Consultant.** The PMU and PIUs will be supported by PMSC's Environmental specialist and three support environmental engineers. Key

tasks of will include, but not limited to, the following:

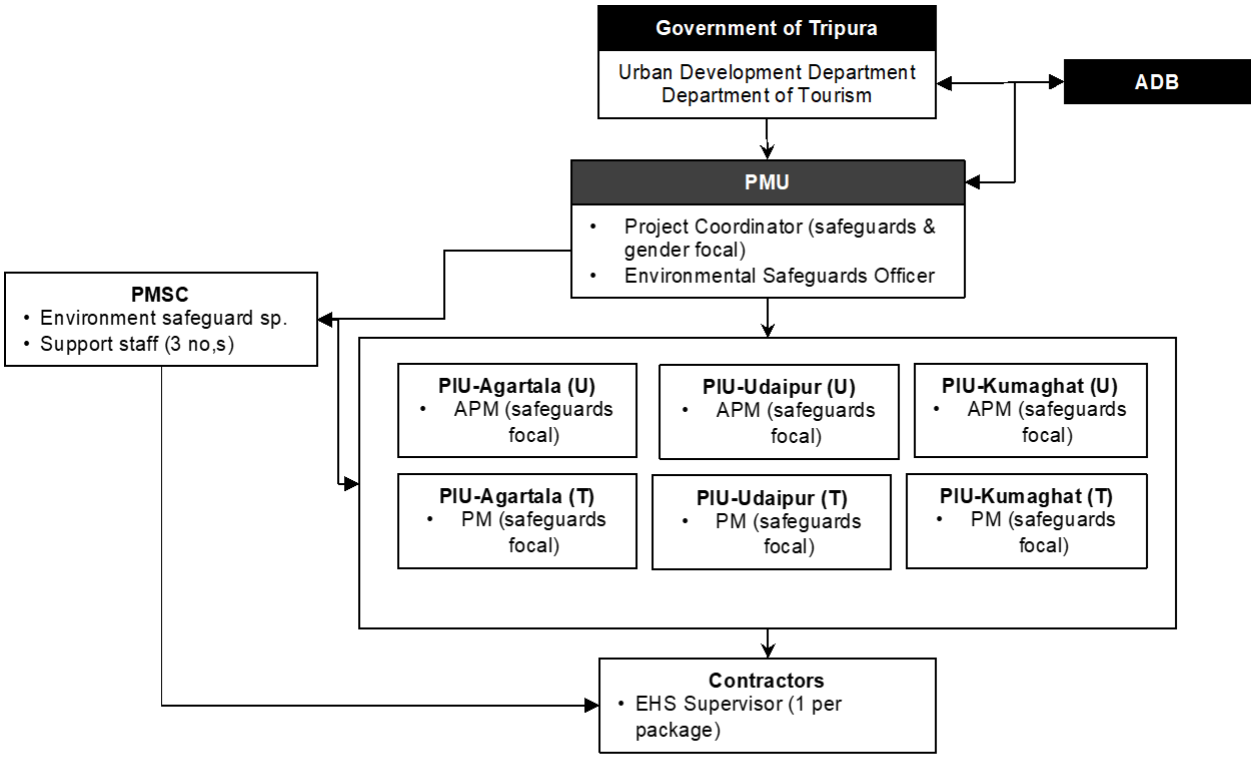
(i) Assist in preparing, updating, reviewing, implementing, monitoring, and reporting of all tasks related to e`nvironmental safeguards as required
(ii) Monitoring of EMP implementation, regulatory compliance, grievance redress, reporting etc.,
(iii) Provide all necessary support and expert guidance to ESO and SO in managing environmental safeguards tasks
(iv) Work closely with design teams to include environmental considerations in subproject location, design and technical specifications
(v) Update IEEs and EMPs as needed to reflect detailed designs, changes in design verification and/or implementation phase of subprojects
(vi) Assist in public consultations, feedback and reporting
(vii) Ensure that the relevant provisions of EMPs, including costs of implementing the EMPs, are fully included in bid and contract documents, particularly in the bill of quantities and cost line items;
(viii) Identify statutory clearances / permissions / approvals required and assist in obtaining them;
(ix) Assist in including standards/conditions of regulatory clearances and consents, if any, in the project design;
(x) Conduct training, capacity building activities for PMU, PIU and contractors
(xi) Ensure compliance with ADB's disclosure requirements as per the SPS;
(xii) Assist PMU/PIUs in reviewing and approving contractor SEMPs, and other associated plans
(xiii) Carry out site verification, and monitor the EMP implementation and ensure compliance by the contractors and subcontractors;
(xiv) Ensure that contractors and their subcontractors comply with labor legislations; ensure that workers are paid and treated according to the labor legislations
(xv) Identify any non-compliances or unanticipated impacts and recommend corrective actions
(xvi) Prepare environmental safeguards section in quarterly reports
(xvii) prepare semiannual environmental monitoring reports
(xviii) Assist in operating GRM effectively
(xix) Advise contractor on appropriate actions on grievances, ensure timely resolution and proper documentation; and
(xx) Support all other environmental safeguards-related activities and tasks of the PMU and PIUs as may be needed.

187. **Contractor.** The approved draft IEEs and EMPs are to be included in bidding and contract documents. The PMU and PIUs will ensure that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable laws and regulations relating to environment, health and safety; (ii) reinstate pathways, other local infrastructure, and agricultural land to at least to their pre-project condition upon the completion of construction; (iii) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation, international treaties for construction and maintenance activities;(b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; (c) no discrimination in respect of employment and occupation; (d) allow freedom of association and effectively recognize the right to collective bargaining, and (e) elimination of forced labor; and (iv) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites. The contractor will be required to appoint a full time Environment, Health and Safety (EHS) supervisor on-site to

implement the EMP. EHS supervisor will assist contractor in the following:

(i) Prepare SEMP and submit to PMU/PIU for approval prior to start of construction
(ii) Comply with the measures forth in the IEEs, the EMPs, and SEMRs
(iii) Ensure implementation of SEMP and report to PIU/PMC on any new or unanticipated impacts
(iv) Ensure that necessary pre-construction and construction permits are obtained
(v) Ensure to adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and
(vi) Conduct orientation, daily briefing sessions, toolbox talks, to workers on environment, health and safety;
(vii) provide appropriate worker facilities at the workplace and labor camps as per the requirements and contractual provisions;
(viii) Carry out site inspections on a regular basis and prepare site-inspection checklists/reports;
(ix) Record EHS incidents and undertake remedial actions;
(x) Conduct environmental monitoring (air, noise, etc.,) as per the monitoring plan
(xi) Prepare monthly EMP monitoring reports and submit to PIU
(xii) Comply with labor legislations, and ensure that subcontractors also implement labor legislations requirements, through cascading of requirements to subcontractors—HR policy, labor management requirements, any worksite specific grievance redress mechanism.
(xiii) Work closely with PIU and PMC to ensure communities are aware of project related impacts, mitigation measures, and GRM; and
(xiv) Receive, record, and redress grievances in an effective and timely manner.
(xv) Provide the PIU/ PMU with a written notice of any unanticipated environmental, impacts that arise during construction, implementation or operation of the Project that were not considered in the IEE, the EMP;
(xvi) Reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction;
(xvii) Site clearance and restoration after the completion of works.

Figure 86: Implementation arrangement for Environment and Social Safeguard



ADB = Asian Development Bank; APM = Assistant project manager; EHS = Environment, Health & Safety; IA – Implementing Agency; PIU = Project Implementation Unit; PMSC = Project Management and Supervision Consultant; PMU = Project Management Unit; PM = project manager

C. Capacity Building and Training

188. Safeguard focal of PIU will be trained by Environmental Safeguard Specialist by PMSC on safeguards issues related to the project, EMP, SEMP and GRM. The SEMP, IPPF and GESI action plan will provide indicative capacity building program which included modules on: (i) introduction and sensitization to ADB SPS on environmental, involuntary resettlement and indigenous people policies and requirements; (ii) project related requirements as provided in the EMP, SEMP, IPPF and GESI action plan, (iii) review, updating and preparation of the IEEs, SEMPs, RPs, DDRs and IPPs (as required) upon the completion of project detailed design; (iv) improved coordination within nodal departments; (v) monitoring and reporting system; and (vi) project GRM.

189. The estimated cost is ₹3,00,000 (excluding trainings of contractors which is e part of EMP implementation cost during construction) to be covered by the project's capacity building program. The detailed cost and specific modules are being customized for the available skill set after assessing the capabilities of the target participants and the requirements of the project by the Environment Safeguard specialist (ESS) of PMSC.

Table 32: Outline Capacity Building Program on EMP Implementation

Description	Target Participants and Venue	Estimate (Rs)	Cost and Source of Funds
1. Introduction and Sensitization to Environmental Issues (1 day) - ADB Safeguards Policy Statement - Government of India and Tripura state applicable safeguard laws, regulations and policies including but not limited to core labor standards, OHS, etc. - Incorporation of EMP into the project design and contracts - Monitoring, reporting and corrective action planning	All staff and consultants involved in the project At PIU-PMU (combined program for all subprojects in one cluster)	150,000	Included in the overall program cost
2. EMP implementation (1/2 day) - EMP mitigation and monitoring measures - Roles and responsibilities - Public relations, - Consultations - Grievance redress - Monitoring and corrective action planning - Reporting and disclosure - Construction site standard operating procedures (SOP) Health & safety, specifically health risk from COVID 19. -- Chance find (archeological) protocol -Traffic management plan Waste management plan - Site clean-up and restoration	All Cluster-PIU staff, contractor staff and consultant involved in the subproject At PIU- cluster- PIUs	150,000 (Lump sum)	Included in subproject cost estimates
3. Contractors Orientation to Workers (1/2 day) - Environment, health and safety in project construction -Health impact and protection from COVID 19	Once before start of work, and thereafter regular briefing every month once. Daily briefing / tool box talk on safety prior to start of work All workers (including unskilled laborers)	100,000	Contractor's cost

D. Monitoring and Reporting

190. Immediately after mobilization and prior to commencement of the works, the contractor is to submit a compliance report to cluster-PIU that all identified pre-construction mitigation measures as detailed in the EMP will be undertaken. Contractor should confirm that the staff for EMP implementation (EHS supervisor/officer) is mobilized. Cluster-PIU is required to review, and approve the report and permit commencement of works.

191. During construction, results from internal monitoring by the contractor is to be reflected in their monthly EMP/SEMP implementation reports to the Cluster-PIU/PIU. PMSC is required to review and advise contractors for corrective actions if necessary. Quarterly report summarizing compliance and corrective measures taken is to be prepared by PMSC team at PIU and to be submitted to PMU. During operation, the contractor is required to conduct management and monitoring actions as per the operation stage EMP and submit to PIU a quarterly report on EMP implementation and compliance.

192. Based on monthly and quarterly reports and measurements, PMU/PIU (assisted by PMSC) is required to submit semi-annual environmental monitoring report (SEMR). Once concurrence from the ADBis received the report will be disclosed on TUDA/PMU websites.

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

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

E. Environmental Management Plan Implementation Cost

195. Most of the mitigation measures require the contractors to adopt good site practices, which should be part of their normal procedures already, so there are unlikely to be major costs associated with compliance. The costs which are specific to EMP implementation and are not covered elsewhere in the projects are given below. **Table 33** indicates cost estimate to implement EMP.

Table 33: Cost Estimates to Implement the Environmental Management Plan

	Particulars	Stages	Unit	Total No.					Rate (INR)	Cost (INR)	Costs Covered By
				Udaipur	Amarpur	Bishramganj	Melaghar	Belonia			
A.	**Implementation staff**										
1	Environment, Health, and Safety Supervisor	Construction	per month (Effective work period for the town)	30	12	24	24	24	70,000	79,80,000	DBO contractor
	Subtotal (A)									**7,980,000**	
B.	**Mitigation Measures**										
1	Consent for establishments and consent for operation from TSPCB (other than WTP)	Pre-construction	Lumpsum	1,00,000	-					100,000	Project cost
2	Provision for tree cutting and compensatory plantation measures (1: 5 ratio replantation) include plantation around sites	Construction	Per tree	100	10	50	40	130	1,000	330,000	Contract
3	Traffic management at work sites (Pavement Markings, Channelizing Devices, Arrow	Construction	Lump sum	100,000	60,000	100,000	120,000	80,000	Lump sum	460,000	Contract

	Particulars	Stages	Unit	Total No.					Rate (INR)	Cost (INR)	Costs Covered By
				Udaipur	Amarpur	Bishramganj	Melaghar	Belonia			
	Panels and Warning Lights)										
4	Provision for COVID-19 preventive measures e.g., mask, sanitizer, etc.	Construction	Lump sum	70,000	30000	50000	50000	50000	Lump sum	250,000	Health & Safety budget
	Subtotal (B)									**1,140,000**	
C.	**Monitoring Measures**										
1	Air quality monitoring	Construction	per sample	24	8	21	24	24	10,000	1,010,000	Contract
2	Noise levels monitoring	Construction	Per sample	24	8	21	24	24	1500	151,500	Contract
3	Surface water monitoring	Construction	Per sample	8	3	8	8	8	8000	280,000	Contract
4	Source water quality, water quality at consumer end	Operation	Lumpsum / year	80,000	40,000	40,000	40,000	40,000		240,000	Contract
5	Sludge quality	Operation	Lumpsum / year	30,000	-	-	-	-		30,000	
6	COVID-19 health monitoring at operating sites	Construction	Per thermal gun	5	5	5	5	5	5000	125,000	Item rate contract
	Subtotal (C)									**1,836,000**	
D.	**Capacity Building**										
1	Introduction and Sensitization to Environmental Issues	Pre-construction	Lump sum	1,50,000	1,50,000	1,50,000	1,50,000	1,50,000	Lump sum	750,000	PIU

	Particulars	Stages	Unit	Total No.					Rate	Cost	Costs Covered By
									(INR)	(INR)	
				Udaipur	Amarpur	Bishramganj	Melaghar	Belonia			
2	EMP implementation	Pre-construction	Lump sum	1,50,000	1,50,000	1,50,000	1,50,000	1,50,000	Lump sum	750,000	PIU
3	Contractors Orientation to Workers on EMP implementation	Prior to dispatch to worksite	Lump sum	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000	Lump sum	400,000	Contract
	Subtotal (D)									**1,900,000**	
E	**Civil Works**										
	Water Sprinkling for dust suppression	Construction	KL	2000	1000	2000	1000	1500	120	900,000	Civil works contract under DBO Contractor
	Rainwater Harvesting for water conservation	Construction at proposed WTP sites	Nos.	1	-	-	-	-	438819	438,819	Civil works contract under DBO Contractor
	Subtotal									**1,338,819**	
F	**Barricading**										
	Providing and fixing Barricading using 40 mm dia M.S. pipe vertical and horizontal posts	Construction	m	Already included in Civil cost							Civil works contract under DBO Contractor
	Providing and fixing using 40 mm dia M.S. pipe ("B" class) as vertical post and PVC tape	Construction	m	Already included in Civil cost							Civil works contract under DBO Contractor
	Subtotal										

	Particulars	Stages	Unit	Total No.					Rate (INR)	Cost (INR)	Costs Covered By
				Udaipur	Amarpur	Bishramganj	Melaghar	Belonia			
G	**Grievance Redressal Mechanism**			**350000**	**350000**	**350000**	**350000**	**350000**	Lumpsum	**1,750,000**	Civil works contract under DBO Contractor
	Total (A+B+C+D+E+F+G)								**INR**	**15,944,819**	
								Contractor Cost	**INR**	14,444,819	
								PIU Cost	**INR**	1,500,000	
								Total	**INR**	**15,944,819**	

X. CONCLUSION AND RECOMMENDATIONS

196. The process described in this document has assessed the environmental impacts of all elements of the proposed water supply subproject for Cluster IIA towns. All potential impacts are identified in relation to pre-construction, construction, and operation phases. Planning principles and design considerations have been reviewed and incorporated into the site planning and design process wherever possible; thus, environmental impacts as being due to the project design or location were not significant.

197. The main design impacts of water supply system in general are due to abstraction of water. The Raw water source is River Gomati for Udaipur flowing near town, which has good quantity of water throughout the year, even during the lean flow season. Proposed withdrawal for the project is well within the quantum of water allocated to Udaipur town by Water Resource Investigation Division. The quality of raw water is good and is suitable for drinking water supply after conventional treatment and disinfection. For Bishramganj and Belonia town ground water is selected as source after studying the sustainability of tube wells. For Amarpur and Melaghar town new ground/ Surface water source not considered because present water source is capable to serve till the year 2038. The existing surface water-based systems, including the water treatment plants (WTP) will be used to meet part of the water demand. Preliminary audit of WTPs conducted during the IEE indicate no legal non-compliance, however, suggests improvements such as in backwash and sludge management systems, chemical storage/handling etc. Detailed technical assessment will be conducted by DBO contractor during the detailed design, and PMU will ensure that necessary improvements are taken up by DWS.

198. Locations for subproject components are selected on government-owned lands. There are no environmentally, or historically or archeologically sensitive or protected areas within or adjoining the project sites. There are two protected monuments in Udaipur (Chaturdasha Devata Temple and Gunavati group of temples), and Rudrasagar lake, a Ramsar notified wetland, in Melaghar. These are located within the urban areas, however, none of the components are located in the protected sites. Except water distribution lines (90-150 mm diameter), which are located at about 40-50 m from the boundary of protected areas, none of the components like intake, service reservoirs or WTP is located close to these sites. Since pipes of small diameter, and will be buried underground, no notable impacts envisaged. Measures suggested to control dust, noise, silt-laden / contaminated runoff from construction sites, etc. along with scheduling of activities and not locating construction facilities close to the protected areas.

199. Construction activities will be confined to the selected sites, and the interference with the general public and community around will be minimal. There will be temporary negative impacts, arising mainly from construction dust and noise, hauling of construction material, waste, and equipment on local roads (traffic, dust, safety etc.), mining of construction material, occupation health and safety aspects including COVID 19 risks and prevention. During the construction phase of pipeline work along the public roads, impacts will arise from the construction dust and noise; from the disturbance of residents, businesses, traffic by the construction work, and from the need to dispose of moderate quantities of waste soil. The social impacts (access disruptions) due to construction activities are expected to be minimal. Trenchless technology will be suggested at critical sections where pipeline crosses the main transportation corridors. These are all general impacts of construction in urban and habitation areas, and there are well developed methods of mitigation that are suggested in the EMP.

200. Anticipated impacts of water supply during operation and maintenance will be related to ground water withdrawal, storage, and distribution. Water supply system will be operated using

the standard operating procedures following an operating manual, which will be prepared by the Contractor. Thus, considering the design and proposed operational procedures, it is unlikely that there will be any significant negative impacts due to operation of water supply system. The Contractor / Operator will implement the operation stage EMP.

201. The public participation processes undertaken during project design ensured stakeholders are engaged during the preparation of the IEE. The planned information disclosure measures and process for carrying out consultation with affected people will facilitate their participation during project implementation. The project's grievance redress mechanism will provide the citizens with a platform for redress their grievances, and describes the informal and formal channels, time frame, and mechanisms for resolving complaints.

202. The EMP will assist the project agencies and contractor in mitigating the environmental impacts and guide them in the environmentally sound execution of the proposed project. A copy of the EMP/approved SEMP shall be always kept on-site during the construction period. The EMP shall be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document shall constitute a failure in compliance.

203. The project will benefit the general public by contributing to the long-term improvement of water supply system and community livability in the project area, Udaipur, Amarpur, Bishramganj, Melaghar and Belonia towns. The potential adverse environmental impacts are mainly related to the construction period, which can be minimized by the mitigating measures and environmentally sound engineering and construction practices.

204. **Conclusion.** Therefore, as per ADB SPS, the project is classified as environmental category B and does not require further environmental impact assessment. However, to conform to government guidelines. As per requirement, this IEE shall be updated after finalization of design by DBO contractor and later in case of change in location or scope of the package during implementation. Report will be reviewed and approved by PIU/PMU before sending to ADB.

205. **Recommendations.** The following are recommendations applicable to the subproject to ensure no significant impacts:

(i) Obtain all statutory clearances at the earliest time possible and ensure conditions/provisions are incorporated in the detailed design;
(ii) Consult ASI during detailed design stage, and obtain prior permission for works within 300 m if required; incorporate any measures suggested by ASI into the design and construction
(iii) Include this IEE in bid and contract documents;
(iv) PMU to ensure adequate treatment capacity and treatment efficiency of WTP meeting National standards in compliance with government regulations.
(v) Update/revise this IEE based on detailed design and/or if there are unanticipated impacts, change in scope, alignment, or location;
(vi) Conduct safeguards induction to the contractor upon award of contract;
(vii) Ensure that the construction and demolition waste generated from demolition is existing structure to be reused and disposed as per guidelines stipulated in Construction and Demolition Waste Management Rules 2016
(viii) Ensure contractor appointed qualified environment, health, and safety (EHS) officers prior to start of works;
(ix) Timely disclosure of information and establishment of GRM;

(x) Involvement of contractors, including subcontractors, in first level GRM;
(xi) Strictly supervise EMP implementation specifically near Rudrasagar Ramsar site and ASI protected areas in Udaipur;
(xii) Continuous consultations with stakeholders;
(xiii) Documentation and reporting on a regular basis as indicated in the IEE.
(xiv) Commitment from PMU, PIUs, project consultants, and contractors to protect the environment and the people from any impact during project implementation

Appendix 1: REA Checklist

RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST- UDAIPUR

Country/Project Title: India/ Tripura Urban & Tourism Development Project
Sector: Water Supply

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting ***Is the project area…***			
• Densely populated?		✓	Udaipur town is not densely populated. The subproject area comprises different part of the town, Project locations supports open area, residential and commercial areas.
• Heavy with development activities?		✓	The area comprises of residential structures, commercial establishments, and open area. The developmental activities such as construction works are ongoing at an average pace.
• Adjacent to or within any environmentally sensitive areas?		✓	Water supply work will be carried out within Udaipur town and outskirt of the town (specifically intake and WTP). There is no forest area nearby.
• Cultural heritage site	✓		Within the Udaipur city there is two archaeological protected (ASI) area. Gunavati Group of Temples and Chaturdasa Devata Temple are located at Radhakishorepur, Udaipur. Water supply pipelines will be laid in inhabited area near ASI protected monuments Gunavati Group of Temples and Chaturdasa Devata Temple, work will be done as per the heritage bylaw of monuments. Sculptures and Rock-cut reliefs of the Unakoti Tirtha, Rajnagar ASI protected area located within 5 km from the city. Water supply project components are not located within the ASI protected area
• Protected Area	✓		Water supply pipelines works are planned near existing household near ASI protected monuments.
• Wetland		✓	None
• Mangrove		✓	Not Applicable
• Estuarine		✓	Not Applicable
• Buffer zone of protected area		✓	Water supply project component locations not within buffer zone of any protected area
• Special area for protecting biodiversity		✓	None of the subproject component sites are adjacent to or within any special area for protecting biodiversity
• Bay		✓	Not Applicable

SCREENING QUESTIONS	Yes	No	REMARKS
B. Potential Environmental Impacts Will the Project cause…			
• Pollution of raw water supply from upstream waste water discharge from communities, industries, agriculture, and soil erosion runoff?		✓	Not expected as per site conditions. Water surveillance program will be included to monitor the raw water quality.
• Impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	No impact expected.
• Hazard of land subsidence caused by excessive ground water pumping?		✓	Not applicable; subproject does not involve new groundwater abstraction.
• Social conflicts arising from displacement of communities?		✓	Project does not involve land acquisition /displacement. No social conflicts envisaged
• Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		✓	Project involves construction of new intake on River Gomati, which has abundant quantity of water throughout the year, even during the lean flow season (February to May). One intake already existing on River Gomati. There is no ground water abstraction as a part of this sub project.
• Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?		✓	Quality of raw water is in general, of acceptable quality and that can be used for potable purposes after conventional treatment and disinfection. Water quality testing should be done before treatment and after treatment.
• Delivery of unsafe water to distribution system?		✓	Water will be treated and disinfected prior to supply. The water treatment plant will ensure all quality criteria set by CPCB for drinking water standards.
• Inadequate protection of intake works or wells, leading to pollution of water supply?		✓	Water quality surveillance program will be included to monitor the raw water quality.
• Over pumping of ground water, leading to salinization and ground subsidence?		✓	Not applicable; subproject does not involve groundwater abstraction
• Excessive algal growth in storage reservoir?		✓	Regular cleaning of storage tanks will be conducted during operation
• Increase in production of sewage beyond capabilities of community facilities?	✓		Sanitation and Septage management system will be developed in the project area The major drains running the core area of the town are identified for interception and diversion to the proposed STP site. Sewerage system has been designed considering water supply at the rate of 135 lpcd, keeping in mind for future wastewater discharge. These components are proposed to be funded under AMRUT/ or similar scheme of GOI
• Inadequate disposal of sludge from water treatment plants?		✓	Appropriate provisions for sludge drying and disposal is included in the project

SCREENING QUESTIONS	Yes	No	REMARKS
B. Potential Environmental Impacts Will the Project cause…			
• Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		✓	Adequate buffer will be provided around WTP with noise control walls to minimize noise propagation. Already one WTP is existing in Udaipur. A green belt area will be developed surrounding the boundary wall of the water treatment plant. Trees with thick canopy will be planted in order to reduce the noise levels reaching the nearby surroundings.
• Impairments associated with transmission lines and access roads?	✓		Temporary impairments are anticipated along the new transmission line routes during construction stage.
• Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.		✓	Measures for safe handling, storage and usage of chlorine are included.
• Health and safety hazards to workers from the management of chlorine used for disinfection and other contaminants?		✓	Operation and Maintenance recommended by the manufacturers, and the existing norms and guidelines for ensuring the safety of workers will be followed. Measures for safe handling, storage and usage of chlorine are included.
• Dislocation or involuntary resettlement of people		✓	There is no resettlement of people for project implementation.
• Social conflicts between construction workers from other areas and community workers?		✓	The contractor will be utilizing the local labour force as far as possible; in case if it is unavoidable, labour camps and facilities will be provided appropriately. No conflicts envisaged
• Noise and dust from construction activities?	✓		All the construction machineries employed will comply with noise emission standards of Central Pollution Control Board. Dust suppression measures such as water sprinkling will be employed
• Increased road traffic due to interference of construction activities?	✓		Excavation and laying pipelines along public roads will interfere with the traffic. Construction material transport will increase traffic on the local roads. Proper traffic management and construction planning will be ensured to minimize the interference
• Continuing soil erosion/silt runoff from construction operations?	✓		Construction work during monsoon shall be carried out with due care so that silt run off due to construction operation is prevented. No construction will be allowed during rains.
• Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?		✓	The Contractor shall prepare an O&M manual for approval of the Employer and training will be given to the staff operating the plant to ensure proper O&M.

SCREENING QUESTIONS	Yes	No	REMARKS
B. Potential Environmental Impacts Will the Project cause…			
• Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		✓	Not envisaged. Online monitoring of process water is proposed as part of the subproject and ensured by the Contractor. Care should be taken during O&M period to ensure that corrosive chemicals are not entered in distribution networks.
• Accidental leakage of chlorine gas?		✓	There is risk that inappropriate handling, storage, or use of chorine may cause serious accidents due to leakage causing severe health risks. Measures for safe handling, storage and usage of chlorine are included in EMP.
• Excessive abstraction of water affecting downstream water users?		✓	Gomati River stores enough water throughout the year, and the water abstraction for the project is negligible even during lean seasons and hence extraction will not affect any downstream users.
• Competing uses of water?		✓	Adequate capacity of raw River water is already available.
• Increased sewage flow due to increased water supply	✓		Sanitation & sewerage / septage is planned under separate scheme under Government's fund.
• Increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant	✓		Improved sanitation and sewerage are required. As part of a separate project supported by the GoI's AMRUT/ or similar scheme, additional wastewater as well as the proper sludge treatment (septage management) and disposal facility are planned.
• Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	No as such impact anticipated
• Social conflicts if workers from other regions or countries are hired?		✓	No such conflicts are anticipated. Preference will be given to local laborers and migratory labour shall be employed in unavoidable circumstances only.
• Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		✓	No as such impact anticipated
• Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		✓	No such impact is anticipated in case of the proposed work. Community safety will be maintained during construction.

RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST - AMARPUR

Country/Project Title: India/ Tripura Urban & Tourism Development Project
Sector: Water Supply

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting **Is the project area…**			
Densely populated?		✓	Amarpur is not densely populated. The subproject area comprises different part of the town, Project locations supports open area, residential and commercial areas.
Heavy with development activities?		✓	The area comprises of residential structures, commercial establishments, and open area. The developmental activities such as construction works are ongoing at an average pace.
Adjacent to or within any environmentally sensitive areas?		✓	Water supply work will be carried out within Amarpur town.
Cultural heritage site		✓	Chabimura is a Geo-heritage / Geo-tourism site of Tripura which is situated 8.1 km away from Amarpur Water supply project components are not located nearby the ASI protected area
Protected Area		✓	No work components within or near ASI protected area.
Wetland		✓	None
Mangrove		✓	Not Applicable
Estuarine		✓	Not Applicable
Buffer zone of protected area		✓	Water supply project component locations not within buffer zone of any protected area
Special area for protecting biodiversity		✓	None of the subproject component sites are adjacent to or within any special area for protecting biodiversity
Bay		✓	Not Applicable
SCREENING QUESTIONS	**Yes**	**No**	**REMARKS**
B. Potential Environmental Impacts **Will the Project cause…**			
Pollution of raw water supply from upstream waste water discharge from communities, industries, agriculture, and soil erosion runoff?		✓	Not expected as per site conditions. Water surveillance program will be included to monitor the raw water quality.
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	No impact expected. No cultural monuments and historical sites nearby the project locations.
Hazard of land subsidence caused by excessive ground water pumping?		✓	No abstraction of ground water planned under the project
Social conflicts arising from displacement of communities?		✓	Project does not involve land acquisition /displacement. No social conflicts envisaged
Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		✓	No new abstraction of water considered
Unsatisfactory raw water supply (e.g. excessive pathogens or mineral		✓	Quality of raw water is in general, of acceptable quality and that can be used for potable purposes after conventional

SCREENING QUESTIONS	Yes	No	REMARKS
constituents)?			treatment and disinfection. Water quality testing should be done before treatment and after treatment.
Delivery of unsafe water to distribution system?		✓	Water will be treated and disinfected prior to supply. The water treatment plant will ensure all quality criteria set by CPCB for drinking water standards.
Inadequate protection of intake works or wells, leading to pollution of water supply?		✓	Water quality surveillance program will be included to monitor the raw water quality.
Over pumping of ground water, leading to salinization and ground subsidence?		✓	Not applicable; subproject does not involve groundwater abstraction
Excessive algal growth in storage reservoir?		✓	Regular cleaning of storage tanks will be conducted during operation
Increase in production of sewage beyond capabilities of community facilities?	✓		Sanitation and Septage management system will be developed in the project town The major drains running the core area of the town are identified for interception and diversion to the proposed STP site. Sewerage system has been designed considering water supply at the rate of 135 lpcd, keeping in mind for future wastewater discharge. These components are proposed to be funded under AMRUT/ or similar scheme of GOI
Inadequate disposal of sludge from water treatment plants?		✓	Appropriate provisions for sludge drying and disposal is included
Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		✓	No new treatment plant will be constructed under the project.
Impairments associated with transmission lines and access roads?	✓		Temporary impairments are anticipated along the new transmission line routes during construction stage.
Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.		✓	Measures for safe handling, storage and usage of chlorine are included.
Health and safety hazards to workers from the management of chlorine used for disinfection and other contaminants?		✓	Operation and Maintenance recommended by the manufacturers, and the existing norms and guidelines for ensuring the safety of workers will be followed. Measures for safe handling, storage and usage of chlorine are included.
Dislocation or involuntary resettlement of people		✓	There is no resettlement of people for project implementation.
Social conflicts between construction workers from other areas and community workers?		✓	The contractor will be utilizing the local labour force as far as possible; in case if it is unavoidable, labour camps and facilities will be provided appropriately. No conflicts envisaged
Noise and dust from construction activities?	✓		All the construction machineries employed will comply with noise emission standards of Central Pollution Control Board. Dust suppression measures such as water sprinkling will be

SCREENING QUESTIONS	Yes	No	REMARKS
			employed
Increased road traffic due to interference of construction activities?	✓		Excavation and laying pipelines along public roads will interfere with the traffic. Construction material transport will increase traffic on the local roads. Proper traffic management and construction planning will be ensured to minimize the interference
Continuing soil erosion/silt runoff from construction operations?	✓		Construction work during monsoon shall be carried out with due care so that silt run off due to construction operation is prevented. No construction will be allowed during rains.
Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?		✓	The Contractor shall prepare an O&M manual for approval of the Employer and training will be given to the staff operating the plant to ensure proper O&M.
Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		✓	Not envisaged. Online monitoring of process water is proposed as part of the subproject and ensured by the Contractor. Care should be taken during O&M period to ensure that corrosive chemicals are not entered in distribution networks.
Accidental leakage of chlorine gas?		✓	No handling of chlorine is required for the proposed work components of the sub project.
Excessive abstraction of water affecting downstream water users?		✓	No abstraction of surface water.
Competing uses of water?		✓	Adequate capacity of raw River water is already available
Increased sewage flow due to increased water supply	✓		Sanitation & sewerage / septage is planned under separate scheme under Government's fund
Increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant	✓		Improved sanitation and sewerage are required. As part of a separate project supported by the GoI's AMRUT/ or similar scheme, additional wastewater as well as the proper sludge treatment (septage management) and disposal facility are planned..
Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	No as such impact anticipated
Social conflicts if workers from other regions or countries are hired?		✓	No as such conflicts are anticipated. Preference will be given to local laborers and migratory labour shall be employed in unavoidable circumstances only.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		✓	No as such impact anticipated
Community safety risks due to both accidental and natural		✓	No such impact is anticipated in case of the proposed work. Community safety will be maintained during construction.

SCREENING QUESTIONS	Yes	No	REMARKS
hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			

RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST - BISHRAMGANJ

Country/Project Title: India/ Tripura Urban & Tourism Development Project
Sector: Water Supply

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting **Is the project area…**			
Densely populated?		✓	Bisharmganj is not densely populated. The subproject area comprises different part of the town, Project locations supports open area, residential and commercial areas.
Heavy with development activities?		✓	The areas comprise of residential structures, commercial establishments, and open area. The developmental activities such as construction works are ongoing at an average pace.
Adjacent to or within any environmentally sensitive areas?		✓	Water supply work will be carried out within the Bisharmganj town.
Cultural heritage site		✓	Ancient Remains, Boxanagar-The discovery of massive Buddhist stupa, chaityagriha, a monastery and other associated burnt brick structures at Boxanagar has reflected the art and architecture & religious aspects of ancient Tripura hitherto unknown. This archaeological is situated 17.83 km (aerial distance) away from the Bishramganj. Water supply project components are not located nearby the ASI protected area
Protected Area		✓	No work components within ASI protected area.
Wetland		✓	None
Mangrove		✓	Not Applicable
Estuarine		✓	Not Applicable
Buffer zone of protected area		✓	Water supply project component locations not within buffer zone of any protected area
Special area for protecting biodiversity		✓	None of the subproject component sites are adjacent to or within any special area for protecting biodiversity Sepahijala wildlife sanctuary located 5.9 km (aerial distance) from Bishramganj town.
Bay		✓	Not Applicable
SCREENING QUESTIONS	**Yes**	**No**	**REMARKS**
B. Potential Environmental Impacts **Will the Project cause…**			
Pollution of raw water supply		✓	Not expected as per site conditions. Water surveillance

SCREENING QUESTIONS	Yes	No	REMARKS
from upstream waste water discharge from communities, industries, agriculture, and soil erosion runoff?			program will be included to monitor the raw water quality.
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	No impact expected. No cultural monuments and historical sites near project locations.
Hazard of land subsidence caused by excessive ground water pumping?		✓	No excessive pumping of ground water is planned. DTW will be constructed at different areas of the town. Only permissible amount of water will be pumped out for water supply.
Social conflicts arising from displacement of communities?		✓	Project does not involve land acquisition /displacement. No social conflicts envisaged
Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		✓	No new surface water intake is planned. There will be ground water abstraction through deep tube well as a part of this sub project. No conflicts expected.
Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?		✓	Raw water is ground water from deep tube well and will be passed through IRP. After release from IRP water will be stored for distribution. Ground water generally free from pathogens and satisfactory for distribution. Water quality testing should be done before storage and distribution.
Delivery of unsafe water to distribution system?		✓	Raw Ground water will be passed through IRP and distribution of unsafe water not expected.
Inadequate protection of intake works or wells, leading to pollution of water supply?		✓	Water quality surveillance program will be included to monitor the raw water quality.
Over pumping of ground water, leading to salinization and ground subsidence?		✓	Over pumping will be not allowed
Excessive algal growth in storage reservoir?		✓	Regular cleaning of storage tanks will be conducted during operation
Increase in production of sewage beyond capabilities of community facilities?	✓		Sanitation and Septage management system will be developed in the project town
Inadequate disposal of sludge from water treatment plants?		✓	Appropriate provisions for sludge drying and disposal is included in the project
Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		✓	No new treatment plant will be constructed under the project
Impairments associated with transmission lines and access roads?	✓		Temporary impairments are anticipated along the new transmission line routes during construction stage.
Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.		✓	Measures for safe handling, storage and usage of chlorine are included.
Health and safety hazards to		✓	Operation and Maintenance recommended by the

SCREENING QUESTIONS	Yes	No	REMARKS
workers from the management of chlorine used for disinfection and other contaminants?			manufacturers, and the existing norms and guidelines for ensuring the safety of workers will be followed. Measures for safe handling, storage and usage of chlorine are included.
Dislocation or involuntary resettlement of people		✓	There is no resettlement of people for project implementation.
Social conflicts between construction workers from other areas and community workers?		✓	The contractor will be utilizing the local labour force as far as possible; in case if it is unavoidable, labour camps and facilities will be provided appropriately. No conflicts envisaged
Noise and dust from construction activities?	✓		All the construction machineries employed will comply with noise emission standards of Central Pollution Control Board. Dust suppression measures such as water sprinkling will be employed
Increased road traffic due to interference of construction activities?	✓		Excavation and laying pipelines along public roads will interfere with the traffic. Construction material transport will increase traffic on the local roads. Proper traffic management and construction planning will be ensured to minimize the interference
Continuing soil erosion/silt runoff from construction operations?	✓		Construction work during monsoon shall be carried out with due care so that silt run off due to construction operation is prevented. No construction will be allowed during rains.
Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?		✓	The Contractor shall prepare an O&M manual for approval of the Employer and training will be given to the staff operating the plant to ensure proper O&M.
Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		✓	Not envisaged. Online monitoring of process water is proposed as part of the subproject and ensured by the Contractor. Care should be taken during O&M period to ensure that corrosive chemicals are not entered in distribution networks.
Accidental leakage of chlorine gas?		✓	There is risk that in appropriate handling, storage or use of chorine may cause serious accidents due to leakage causing severe health risks. Measures for safe handling, storage and usage of chlorine are included in EMP.
Excessive abstraction of water affecting downstream water users?		✓	No abstraction of surface water.
Competing uses of water?		✓	Adequate capacity of ground water is already available.
Increased sewage flow due to increased water supply	✓		Sanitation & sewerage / septage needs to be improved
Increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant	✓		Sanitation & sewerage/ septage needs to be improved. Additional wastewater and appropriate sludge treatment (septage management) and disposal facility is planned by local government with its own fund
Large population influx during project construction and operation that causes increased burden on social		✓	No as such impact anticipated

SCREENING QUESTIONS	Yes	No	REMARKS
infrastructure and services (such as water supply and sanitation systems)?			
Social conflicts if workers from other regions or countries are hired?		✓	No as such conflicts are anticipated. Preference will be given to local laborers and migratory labour shall be employed in unavoidable circumstances only.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		✓	No as such impact anticipated
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		✓	No such impact is anticipated in case of the proposed work. Community safety will be maintained during construction.

RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST - MELAGHAR

Country/Project Title: India/ Tripura Urban & Tourism Development Project
Sector: Water Supply

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting **Is the project area…**			
Densely populated?		✓	Melaghar is not densely populated. The subproject area comprises different part of the town, Project locations supports open area, residential and commercial areas.
Heavy with development activities?		✓	The areas comprise of residential structures, commercial establishments, and open area. The developmental activities such as construction works are ongoing at an average pace.
Adjacent to or within any environmentally sensitive areas?		✓	Water supply work will be carried out within the already developed urban area of Melaghar town.
Cultural heritage site		✓	Ancient Remains, Boxanagar-The discovery of massive Buddhist stupa, Chaityagriha, a monastery and other associated burnt brick structures at Boxanagar has reflected the art and architecture & religious aspects of ancient Tripura hitherto unknown. This archaeological is situated 18 km (aerial distance) away from the Melaghar. Water supply project components are not located nearby the ASI protected area
Protected Area		✓	No work components are located within ASI protected area.

SCREENING QUESTIONS	Yes	No	REMARKS
Wetland	✓		Rudrasagar Lake is located in Melaghar MC. It is a natural sedimentation reservoir which receives flow from three perennial streams, viz., Noacherra, Durlavnarayan-cherra and Kamtali-cherra. No construction activity considered within Ramsar area of Rudrasagar lake. Two distribution pipelines of about 160 m and 83 m of 90 mm dia. is proposed in residential area for domestic connection near Rudrasagar lake. The distance of these pipeline is about 45 m to 160 m from the lake within the ROW of the existing municipal roads. No impact on wetland is envisaged.
Mangrove		✓	Not Applicable
Estuarine		✓	Not Applicable
Buffer zone of protected area		✓	Water supply project component locations not within buffer zone of any protected area
Special area for protecting biodiversity		✓	None of the subproject component sites are adjacent to or within any special area for protecting biodiversity Sepahijala wildlife sanctuary located about 15 km (aerial distance) from Melaghar town.
Bay		✓	Not Applicable
SCREENING QUESTIONS	**Yes**	**No**	**REMARKS**
B. Potential Environmental Impacts **Will the Project cause…**			
Pollution of raw water supply from upstream waste water discharge from communities, industries, agriculture, and soil erosion runoff?		✓	Not expected as per site conditions. Water surveillance program will be included to monitor the raw water quality.
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	No impact expected. No cultural monuments and historical sites near project locations.
Hazard of land subsidence caused by excessive ground water pumping?		✓	No excessive pumping of ground water is planned. Existing source will be used
Social conflicts arising from displacement of communities?		✓	Project does not involve land acquisition /displacement. No social conflicts envisaged
Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		✓	No new surface water intake is planned. There will be no ground water abstraction also. No conflicts expected.
Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?		✓	Quality of raw water is in general, of acceptable quality and that can be used for potable purposes after conventional treatment and disinfection. Water quality testing should be done before treatment and after treatment.
Delivery of unsafe water to distribution system?		✓	Raw Ground water will be passed through IRP and distribution of unsafe water not expected.
Inadequate protection of intake works or wells, leading to pollution of water supply?		✓	Water quality surveillance program will be included to monitor the raw water quality.
Over pumping of ground water, leading to salinization		✓	No ground water extraction will anticipate.

SCREENING QUESTIONS	Yes	No	REMARKS
and ground subsidence?			
Excessive algal growth in storage reservoir?		✓	Regular cleaning of storage tanks will be conducted during operation
Increase in production of sewage beyond capabilities of community facilities?	✓		Sanitation and Septage management system will be developed in the project town. The major drains running the core area of the town are identified for interception and diversion to the proposed STP site. Sewerage system has been designed considering water supply at the rate of 135 lpcd, keeping in mind for future wastewater discharge. These components are proposed to be funded under AMRUT/ similar scheme of GOI
Inadequate disposal of sludge from water treatment plants?		✓	No sludge generation is expected from the present project
Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		✓	No new treatment plant will be constructed under the project
Impairments associated with transmission lines and access roads?	✓		Temporary impairments are anticipated along the new transmission line routes during construction stage.
Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.		✓	Measures for safe handling, storage and usage of chlorine are included.
Health and safety hazards to workers from the management of chlorine used for disinfection and other contaminants?		✓	Operation and Maintenance recommended by the manufacturers, and the existing norms and guidelines for ensuring the safety of workers will be followed. Measures for safe handling, storage and usage of chlorine are included.
Dislocation or involuntary resettlement of people		✓	There is no resettlement of people for project implementation.
Social conflicts between construction workers from other areas and community workers?		✓	The contractor will be utilizing the local labour force as far as possible; in case if it is unavoidable, labour camps and facilities will be provided appropriately. No conflicts envisaged
Noise and dust from construction activities?	✓		All the construction machineries employed will comply with noise emission standards of Central Pollution Control Board. Dust suppression measures such as water sprinkling will be employed
Increased road traffic due to interference of construction activities?	✓		Excavation and laying pipelines along public roads will interfere with the traffic. Construction material transport will increase traffic on the local roads. Proper traffic management and construction planning will be ensured to minimize the interference
Continuing soil erosion/silt runoff from construction operations?	✓		Construction work during monsoon shall be carried out with due care so that silt run off due to construction operation is prevented. No construction will be allowed during rains.
Delivery of unsafe water due to poor O&M treatment		✓	The Contractor shall prepare an O&M manual for approval of the Employer and training will be given to the staff

SCREENING QUESTIONS	Yes	No	REMARKS
processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?			operating the plant to ensure proper O&M.
Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		✓	Not envisaged. Online monitoring of process water is proposed as part of the subproject and ensured by the Contractor. Care should be taken during O&M period to ensure that corrosive chemicals are not entered into the distribution networks.
Accidental leakage of chlorine gas?		✓	There is risk that in appropriate handling, storage or use of chorine may cause serious accidents due to leakage causing severe health risks. Measures for safe handling, storage and usage of chlorine are included in EMP.
Excessive abstraction of water affecting downstream water users?		✓	No abstraction of surface water.
Competing uses of water?		✓	Adequate capacity of ground water is already available.
Increased sewage flow due to increased water supply	✓		Sanitation & sewerage / septage is planned under separate scheme under Government's fund
Increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant	✓		Improved sanitation and sewerage are required. As part of a separate project supported by the GoI's AMRUT scheme, additional wastewater as well as the proper sludge treatment (septage management) and disposal facility are planned.
Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	No as such impact anticipated
Social conflicts if workers from other regions or countries are hired?		✓	No as such conflicts are anticipated. Preference will be given to local laborers and migratory labour shall be employed in unavoidable circumstances only.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		✓	No as such impact anticipated
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and		✓	No such impact is anticipated in case of the proposed work. Community safety will be maintained during construction.

SCREENING QUESTIONS	Yes	No	REMARKS
decommissioning?			

RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST- BELONIA

Country/Project Title: India/ Tripura Urban & Tourism Development Project
Sector: Water Supply

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting **Is the project area…**			
Densely populated?		✓	Belonia is not densely populated. The subproject area comprises different part of the town, Project locations supports open area, residential and commercial areas.
Heavy with development activities?		✓	The area comprises of residential structures, commercial establishments, and open area. The developmental activities such as construction works are ongoing at an average pace.
Adjacent to or within any environmentally sensitive areas?		✓	Water supply work will be carried out within the town.
Cultural heritage site		✓	Thakurani Tila- The site is situated in south Tripura district and it is about 13.6 km away from Belonia town. This is ASI protected area. Shyamsundar Tila - A brick-built Buddhist monastic complex, ASI protected site located at Jolaibari, South Tripura and which is 14.6 km away from Belonia town. Water supply project components are not located nearby the ASI protected area
Protected Area		✓	No work components within ASI protected area.
Wetland		✓	None
Mangrove		✓	Not Applicable
Estuarine		✓	Not Applicable
Buffer zone of protected area		✓	Water supply project component locations not within buffer zone of any protected area
Special area for protecting biodiversity		✓	None of the subproject component sites are adjacent to or within any special area for protecting biodiversity
Bay		✓	Not Applicable
SCREENING QUESTIONS	**Yes**	**No**	**REMARKS**
B. Potential Environmental Impacts **Will the Project cause…**			
Pollution of raw water supply from upstream waste water discharge from communities, industries, agriculture, and soil erosion runoff?		✓	Not expected as per site conditions. Water surveillance program will be included to monitor the raw water quality.
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	No impact expected. No cultural monuments and historical sites near project locations.
Hazard of land subsidence caused by excessive ground water pumping?		✓	No excessive pumping of ground water is planned. DTW will be constructed at different areas of the town. Only permissible amount of water will be pumped out for water supply.

SCREENING QUESTIONS	Yes	No	REMARKS
Social conflicts arising from displacement of communities?		✓	Project does not involve land acquisition /displacement. No social conflicts envisaged
Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		✓	No new surface water intake is planned. There will be ground water abstraction through deep tube well as a part of this sub project. No conflicts expected.
Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?		✓	Raw water is ground water from deep tube well and will be passed through IRP. After release from IRP water will be stored for distribution. Ground water generally free from pathogens and satisfactory for distribution. Water quality testing should be done before storage and distribution.
Delivery of unsafe water to distribution system?		✓	Raw Ground water will be passed through IRP and distribution of unsafe water not expected.
Inadequate protection of intake works or wells, leading to pollution of water supply?		✓	Water quality surveillance program will be included to monitor the raw water quality.
Over pumping of ground water, leading to salinization and ground subsidence?		✓	Over pumping will be not allowed
Excessive algal growth in storage reservoir?		✓	Regular cleaning of storage tanks will be conducted during operation
Increase in production of sewage beyond capabilities of community facilities?	✓		Sanitation and Septage management system will be developed in the project town The major drains running the core area of the town are identified for interception and diversion to the proposed STP site. Sewerage system has been designed considering water supply at the rate of 135 lpcd, keeping in mind for future wastewater discharge. These components are proposed to be funded under AMRUT/ similar scheme of GOI
Inadequate disposal of sludge from water treatment plants?		✓	Appropriate provisions for sludge drying and disposal is included in the project
Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		✓	No new treatment plant will be constructed under the project
Impairments associated with transmission lines and access roads?	✓		Temporary impairments are anticipated along the new transmission line routes during construction stage.
Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.		✓	Measures for safe handling, storage and usage of chlorine are included.
Health and safety hazards to workers from the management of chlorine used for disinfection and other contaminants?		✓	Operation and Maintenance recommended by the manufacturers, and the existing norms and guidelines for ensuring the safety of workers will be followed. Measures for safe handling, storage and usage of chlorine are included.
Dislocation or involuntary resettlement of people		✓	There is no resettlement of people for project implementation.

SCREENING QUESTIONS	Yes	No	REMARKS
Social conflicts between construction workers from other areas and community workers?		✓	The contractor will be utilizing the local labour force as far as possible; in case if it is unavoidable, labour camps and facilities will be provided appropriately. No conflicts envisaged
Noise and dust from construction activities?	✓		All the construction machineries employed will comply with noise emission standards of Central Pollution Control Board. Dust suppression measures such as water sprinkling will be employed
Increased road traffic due to interference of construction activities?	✓		Excavation and laying pipelines along public roads will interfere with the traffic. Construction material transport will increase traffic on the local roads. Proper traffic management and construction planning will be ensured to minimize the interference
Continuing soil erosion/silt runoff from construction operations?	✓		Construction work during monsoon shall be carried out with due care so that silt run off due to construction operation is prevented. No construction will be allowed during rains.
Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?		✓	The Contractor shall prepare an O&M manual for approval of the Employer and training will be given to the staff operating the plant to ensure proper O&M.
Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		✓	Not envisaged. Online monitoring of process water is proposed as part of the subproject and ensured by the Contractor. Care should be taken during O&M period to ensure that corrosive chemicals are not entered in distribution networks.
Accidental leakage of chlorine gas?		✓	There is risk that inappropriate handling, storage, or use of chorine may cause serious accidents due to leakage causing severe health risks. Measures for safe handling, storage and usage of chlorine are included in EMP.
Excessive abstraction of water affecting downstream water users?		✓	No abstraction of surface water.
Competing uses of water?		✓	Adequate capacity of ground water is already available.
Increased sewage flow due to increased water supply	✓		Sanitation & sewerage / septage needs to be improved
Increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant	✓		Improved sanitation and sewerage are required. As part of a separate project supported by the GoI's AMRUT/ similar scheme, additional wastewater as well as the proper sludge treatment (septage management) and disposal facility are planned
Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	No as such impact anticipated
Social conflicts if workers from other regions or countries are		✓	No as such conflicts are anticipated. Preference will be given to local laborers and migratory labour shall be

SCREENING QUESTIONS	Yes	No	REMARKS
hired?			employed in unavoidable circumstances only.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		✓	No as such impact anticipated
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		✓	No such impact is anticipated in case of the proposed work. Community safety will be maintained during construction.

Appendix 2: National Ambient Air Quality Standards

A. NATIONAL AMBIENT AIR QUALITY STANDARDS

Parameter	Location [a]	India Ambient Air Quality Standard ($\mu g/m^3$)[b]	WHO Air Quality Guidelines ($\mu g/m^3$)			Applicable Per ADB SPS[e] ($\mu g/m^3$)
			Global Update [c] 2005	Second Edition 2000[d]	Air Pollution Guideline 2021	
PM_{10}	Industrial Residential, Rural and Other Areas	60 (Annual) 100 (24-hr)	20 (Annual) 50 (24-hr)	-	15 (Annual) 45 (24-hr)	20 (Annual) 50 (24-hr)
	Sensitive Area	60 (Annual) 100 (24-hr)	20 (Annual) 50 (24-hr)	-		20 (Annual) 50 (24-hr)
PM_{25}	Industrial Residential, Rural and Other Areas	40 (Annual) 60 (24-hr)	10 (Annual) 25 (24-hr)	-	05 (Annual) 15 (24-hr)	10 (Annual) 25 (24-hr)
	Sensitive Area	40 (Annual) 60 (24-hr)	10 (Annual) 25 (24-hr)			10 (Annual) 25 (24-hr)
SO_2	Industrial Residential, Rural and Other Areas	50 (Annual) 80 (24-hr)	20 (24-hr) 500 (10-min)	-	40 (24-hr) 500 (10-min)	50 (Annual) 20 (24-hr) 500 (10-min)
	Sensitive Area	20 (Annual) 80 (24-hr)	20 (24-hr) 500 (10-min)	-		20 (Annual) 20 (24-hr) 500 (10-min)
NO_2	Industrial Residential, Rural and Other Areas	40 (Annual) 80 (24-hr)	40 (Annual) 200 (1-hr)	-	10 (Annual) 25 (24-hr) 200 (1-hr)	40 (Annual) 80 (24-hr) 200 (1-hr)
	Sensitive Area	30 (Annual) 80 (24-hr)	40 (Annual) 200 (1-hr)	-		30 (Annual) 80 (24-hr) 200 (1-hr)
CO	Industrial Residential, Rural and Other Areas	2,000 (8-hr) 4,000 (1-hr)	-	10,000 (8-hr) 100,000 (15-min)	4 mg/ m^3 (24-hr) 10 mg/ m^3 (8-hr) 35 mg/ m^3(1-hr) 100 mg/ m^3(15-minute)	2,000 (8-hr) 4,000 (1-hr) 100,000 (15-min)
	Sensitive Area	2,000 (8-hr) 4,000 (1-hr)	-	10,000 (8-hr) 100,000 (15-min)		2,000 (8-hr) 4,000 (1-hr) 100,000 (15-min)
Ozone (O_3)	Industrial Residential, Rural and Other Areas	100 (8-hr) 180 (1-hr)	100 (8-hr)		60 (peak season) 100 (8-hr)	100 (8-hr) 180 (1-hr)
	Sensitive Area	100 (8-hr) 180 (1-hr)	100 (8-hr)			100 (8-hr) 180 (1-hr)
Lead (Pb)	Industrial, Residential, Rural and Other Areas	0.5 (Annual) 1.0 (24-hr)		0.5 (Annual)		0.5 (Annual) 1.0 (24-hr)
	Sensitive Area	0.5 (Annual) 1.0 (24-hr)		0.5 (Annual)		0.5 (Annual) 1.0 (24-hr)
Ammonia (NH_3)	Industrial Residential,	100 (Annual) 400 (24-hr)				100 (Annual) 400 (24-hr)

Parameter	Location [a]	India Ambient Air Quality Standard (µg/m^3)[b]	WHO Air Quality Guidelines (µg/m^3)			Applicable Per ADB SPS[e] (µg/m^3)
			Global Update [c] 2005	Second Edition 2000[d]	Air Pollution Guideline 2021	
	Rural and Other Areas					
	Sensitive Area	100 (Annual) 400 (24-hr)				100 (Annual) 400 (24-hr)
Benzene (C_6H_6)	Industrial Residential, Rural and Other Areas	5 (Annual)				5 (Annual)
	Sensitive Area	5 (Annual)				5 (Annual)
Benzo(o)pyrene (BaP) particulate phase only	Industrial Residential, Rural and Other Areas	0.001 (Annual)				0.001 (Annual)
	Sensitive Area	0.001 (Annual)				0.001 (Annual)
Arsenic (As)	Industrial Residential, Rural and Other Areas	0.006 (Annual)				0.006 (Annual)
	Sensitive Area	0.006 (Annual)				0.006 (Annual)
Nickel (Ni)	Industrial Residential, Rural and Other Areas	0.02 (Annual)				0.02 (Annual)
	Sensitive Area	0.02 (Annual)				0.02 (Annual)

[a] *Sensitive area refers to such areas notified by the India Central Government.*

[b] *Notification by Ministry of Environment and Forests, Government of India Environment (Protection) Seventh Amendment Rules, 2009*

[c] *WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide. Global update 2005. WHO 2006*

[d] *Air Quality Guidelines for Europe Second Edition. WHO 2000*

[e] *Per ADB SPS, the government shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS*

Appendix 3: Ambient Noise Quality Standards

Receptor/ Source	India National Noise Level Standards[a] (dBA)		WHO Guidelines Value For Noise Levels Measured Out of Doors[b] (One Hour LA_q in dBA)		Applicable Per ADB SPS[c] (dBA)	
	Day	**Night**	**07:00 – 22:00**	**22:00 – 07:00**	Day time	Night time
Industrial area	75	70	70	70	70	70
Commercial area	65	55	70	70	65	55
Residential Area	55	45	55	45	55	45
Silent Zone	50	40	55	45	50	40

Note-

[a] Noise Pollution (Regulation and Control) Rules, 2002 as amended up to 2010.

[b] Guidelines for Community Noise. WHO. 1999

[c] Per ADB SPS, the government shall achieve whichever of the ambient quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

Appendix 4: Vehicle Exhaust Emission Norms

VEHICLE EXHAUST EMISSION NORMS

1. Passenger Cars

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

2. Heavy Diesel Vehicles

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

Source: Central Pollution Control Board

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

Appendix 5: Labor laws

SALIENT FEATURES OF MAJOR LABOR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN CONSTRUCTION OF CIVIL WORKS

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

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

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

(iv) Maternity Benefit Act, 1951(as amended up to 2017) - The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

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

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

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

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

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

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

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

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

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

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

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

Appendix 6: Audit Report of Existing WTPS and Intakes

Introduction

It is proposed to develop water supply system in Udaipur, Amarpur, Melaghar and Belonia towns. Since existing WTPs are working fine it is proposed to utilized the existing Intakes and WTP along with proposed WTPs and Intakes for the project towns. Sustainability of new water supply infrastructure of intended purpose and benefits (improved environmental conditions, public health etc.) would accrue only with a properly functioning treatment facility. Therefore, the existing WTPs and Intake are an associated facility as per the ADB Safeguard Policy Statement 2009. Compliance with the environmental safeguards will ensure the subproject sustainability.

Name of Plant and address:	**1.3 MGD/ / 5.9 MLD Water Treatment Plant, Udaipur, Tripura**	**0.65 MGD/ 2.95 MLD Water Treatment Plant, Amarpur, Tripura**	**1.05 MGD/ 4.77 MLD Water Treatment Plant, Melaghar, Tripura**	**1 MGD/4.54 MLD Water Treatment Plant, Belonia, Tripura**
1. Capacity:	1 MGD/ 4.54 MLD	0.65 MGD / 2.95 MLD	1.05 MGD/ 4.77 MLD	1 MGD/ 4.54 MLD
2. Technology:	(Conventional Water Treatment Plant) Cascade aerator, Flash Mixer, Clariflocculator, Rapid sand filter, Chlorination, Clear water reservoir and Pumping Station)	Conventional Water Treatment Plant. (Clarriflocculator, Flash mixture, lime dosing tank, Rapid sand filter, pure water sump and Pumping station)	Conventional Water Treatment Plant	Conventional Water Treatment Plant
3. Executing agency:	Udaipur Municipal Council	Amarpur Nagar Panchayat	Melaghar Municipal Council	Belonia Municipal Council
4. Implementing agency:	DWS, Udaipur, Tripura	DWS, Amarpur, Tripura	DWS, Melaghar, Tripura	DWS, Belonia, Tripura
5. Asset owner	DWS Udaipur, Tripura	DWS, Amarpur, Tripura	DWS Melagar, Tripura	DWS Belonia, Tripura
6. Project name under which this WTP was constructed:	Construction of 1.3 MGD Water Treatment Plant in the town of Udaipur, Tripura.	Construction of 0.65 MGD Water Treatment Plant in the town of Amarpur, Tripura.	Construction of 1.05 MGD Water Treatment Plant in the town of Melaghar, Tripura.	Construction of 1 MGD Water Treatment Plant in the town of Belonia, Tripura.
7. Date of start of the construction of WTP:	Not Available	2002	2007	1998
8. Status of work progress of WTP: (completed/ uncompleted components with %)	Completed in 1997	Completed - 2007	Completed in 2011	Completed in 2002
9. Nos., locations and capacities of Pumping station	Pump Capacity: VT Pump of 50 HP Capacity each: 3 nos. (2W+1S)	2 nos. (1W+1S) @ 50000 GPH/ 227 cum/hr each	3 nos. (1W+2S) @ 60000 GPH/ 272.8 cum/hr each	Not Available

Name of Plant and address:	**1.3 MGD/ / 5.9 MLD Water Treatment Plant, Udaipur, Tripura**	**0.65 MGD/ 2.95 MLD Water Treatment Plant, Amarpur, Tripura**	**1.05 MGD/ 4.77 MLD Water Treatment Plant, Melaghar, Tripura**	**1 MGD/4.54 MLD Water Treatment Plant, Belonia, Tripura**
10. Areas of different units of plant (sq. m):	Information not available	620m^2 (Approx.) all units.	Aerator: 24 m^2, Clariflocculator: 600 m^2, Filter beds and disinfection unit: 460 m^2, Backwash Tank: 160 m^2, CWPS with reservoir: 250 m^2, Administrative Building: 350 m^2	Information not available
11. Total Area of land used for WTP:	28408 m^2	1000 m^2	2700 m^2	Information not available
12. Land ownership details: (Khasra nos.)	ULB	ULB	ULB	ULB
13. O&M period of contract:	Information not available	Information not available	Information not available	1 year
14. Status of Consent to Establish (CTE) from Pollution Control Board: obtained/not obtained (attach copy)	Not required	Not required	Not required	Not required
15. Validity of CTE:	Not applicable	Not applicable	Not applicable	Not applicable
16. Status of Consent to Operate (CTO) from Pollution Control Board: obtained/not obtained	Not applicable	Not applicable	Not applicable	Not applicable
17. Validity of CTO:	Not applicable	Not applicable	Not applicable	Not applicable
18. Details of total covered area with this WTP: (ward nos.)	Ward no 1 to Ward no 23	Ward no 1 to Ward no 13	Ward no 1 to Ward no 13	12 out of 17 Wards covered
19. Total Population covered (number and %):	53 %	91%	35 %	56 %
20. Whether trial run completed, if yes give date, if no give tentative date:	1997	September 2007	2011	Completed 28th November 2002

Name of Plant and address:	**1.3 MGD/ / 5.9 MLD Water Treatment Plant, Udaipur, Tripura**	**0.65 MGD/ 2.95 MLD Water Treatment Plant, Amarpur, Tripura**	**1.05 MGD/ 4.77 MLD Water Treatment Plant, Melaghar, Tripura**	**1 MGD/4.54 MLD Water Treatment Plant, Belonia, Tripura**
21. Treatment Efficiency	WTP is designed to treat water parameter as per Government of India's drinking water standard IS 10500 The raw water quality and treated quality results shows the WTP is treating raw water as per required standards and all parameters tested are within the drinking water standards. prescribed limits.	WTP is designed to treat water parameter as per Government of India's drinking water standard IS 10500 The raw water quality and treated quality results shows the WTP is treating raw water as per required standards and all parameters tested are within the drinking water standards prescribed limits except residual chlorine is above the acceptable limit and below the permissible limit as per Indian Drinking water standards.	WTP is designed to treat water parameter as per Government of India's drinking water standard IS 10500 The raw water quality and treated quality results shows the WTP is treating raw water as per required standards and all parameters tested are within the drinking water standards. prescribed limits except residual chlorine is above the acceptable limit and below the permissible limit as per Indian Drinking water standards.	WTP is designed to treat water parameter as per Government of India's drinking water standard IS 10500 The raw water quality and treated quality results shows the WTP is treating raw water as per required standards and all parameters tested are within the drinking water standards. prescribed limits except residual chlorine is above the acceptable limit and below the permissible limit as per Indian Drinking water standards.
22. Is there facility of laboratory for testing these parameters, if yes, give details	Yes	Yes	Yes	Yes
23. What are the proposals/methods for reuse/disposal of treated sludge from WTP:	Sludge is disposed in an adjacent sludge disposal pond and backwash is disposed to river	No proposals/ fixed methods	Sludge is disposed in an adjacent sludge disposal pond and backwash is disposed to river	No proposals/ fixed methods
24. Is this plant anywhere related/ dependent on proposed WTP.	Not Applicable No WTP will be constructed	Not Applicable No WTP will be constructed	Not Applicable No WTP will be constructed	Not Applicable No WTP will be constructed
25. Status and type of electricity connection: (connection number and approved load, KW)	Available- 350 KVA Dedicated electric supply line/sub-station	Available – 2nos. (75 and 37.5x2) KW Dedicated electric supply line/sub-station	Available Dedicated electric supply line/sub-station	Available – 275 KW Dedicated electric supply line/sub-station

Name of Plant and address:	**1.3 MGD/ / 5.9 MLD Water Treatment Plant, Udaipur, Tripura**	**0.65 MGD/ 2.95 MLD Water Treatment Plant, Amarpur, Tripura**	**1.05 MGD/ 4.77 MLD Water Treatment Plant, Melaghar, Tripura**	**1 MGD/4.54 MLD Water Treatment Plant, Belonia, Tripura**
26. Whether DG set installed, if yes give capacity and type of DG set:	No	No	No	No
27. Numbers of employees proposed for operation of plant (designation wise numbers of employees):	Pump operator (Govt.): - 02 Helper: -06 Pump Operator (Agency):- 10	7 nos. (Designation wise not available)	Pump operator (Govt.): - 02 Helper: -04 Pump Operator (Agency):- 06	10 nos. (Designation wise not available)
28. Is rainwater harvesting system established, if yes, provide details, drawing and cost of rainwater harvesting	No	No	No	No
29. Power generation system installed, if yes, give details:	No	No	No	No
30. Is O&M manual prepared by contractor (submitted/ approved):	Yes	No	Yes	Yes
31. Is Emergency operating system prepared for O&M:	No	No	No	Yes
32. Whether provisions for odour control taken in design, if yes, give details:	No	No	No	No
33. If provisions taken to protect inconvenience to nearby habitants, give details:	No nearby habitation. Plantation in and around WTP	No nearby habitation. Plantation in and around WTP	No nearby habitation. Plantation in and around WTP	No nearby habitation. Plantation in and around WTP
34. Any other related information	NA	NA	NA	NA

Details of Existing intake

Town name	Udaipur	Amarpur	Melaghar	Belonia
Source of raw water	Gomati River	Gomati River	Gomati River	Muhuri River
Location of intake	Ward-1, UMC	At Gomati river	At Gomati river	River Dhalai
Capacity of intake	4.7 MLD	2.95 MLD	4.77 MLD	4.54 MLD
Year of construction	1997	2007	2011	2002
Average hours of operation/day	20	16	16	16
Existing Conditions	Operational	Operational	Operational	Operational
Type of pumps	Vertical Turbine Centrifugal Pumps	Vertical turbine centrifugal pump	Vertical Turbine Centrifugal Pumps	Vertical Turbine Centrifugal Pumps
Electric Consumption	No separate record	30000-32000 KW	No separate record	No separate record
Numbers of employees for operation and maintenance of Intake (designation wise numbers of employees)	2 Operator	2 Operators	1 Operator	1 Operator
Proposal under present scheme (/repair/additional intake/no change):	Not available	Not available	Not available	Not available

Analytical results of Water Quality Data of Raw and WTP treated Water from project town Rivers

Date	Turbidity (NTU)		pH		Hardness (mg/l)		Total Iron (mg/l)		R. Cl (mg/l)		TDS (mg/l)		Alkalinity (mg/l)	
	Raw	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**
Udaipur Raw and treated water from Gomati River at WTP														
31/01/2023	83.3	0.82	7.1	7.0	48.6	54	1.22	0.22	-					
01/02/2023	83	0.67	7.05	7.1	48	53	1.23	0.21	-					
02/02/2023	84	0.77	7.05	7.1	49.5	54	1.24	0.21	-					
03/02/2023	84.4	0.83	7.1	7.0	48.4	54	1.29	0.21	-					
04/02/2023	25	0.84	7.1	7.0	49	56	1.22	0.21	-					
Average	**71.94**	**0.786**	**7.08**	**7.04**	**48.7**	**54.2**	**1.24**	**0.212**	-					
Amarpur Raw and treated water from Gomati River at WTP														
20/03/2023	42	0.4	7.2	7.1	64	70	0.6	0.1	-	0.2	52	52	60	72

Date	Turbidity (NTU)		pH		Hardness (mg/l)		Total Iron (mg/l)		R. Cl (mg/l)		TDS (mg/l)		Alkalinity (mg/l)	
	Raw	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**	**Raw**	**Clear**
21/03/2023	42	0.3	7.4	7.1	66	74	0.6	0.1	-	0.3	52	50	64	70
22/03/2023	40	0.4	7.3	7.1	68	72	0.5	0.1	-	0.4	58	52	66	70
23/03/2023	44	0.4	7.2	7.1	66	70	0.5	0.1	-	0.4	56	52	68	70
24/03/2023	46	0.4	7.4	7.1	70	76	0.5	0.1	-	0.3	49	50	64	70
Average	**42.8**	**0.38**	**7.3**	**7.1**	**66.8**	**72.4**	**0.54**	**0.1**	-	**0.32**	**53.4**	**51.2**	**64.4**	**70.4**
Melaghar - Raw and treated water from Gomati River at WTP														
13/03/2023	32	0.84	7.01	7.20	38	40	-	-	-	0.4				
14/03/2023	31	0.78	7.01	7.21	38	39	-	-	-	0.4				
15/03/2023	34	0.82	7.00	7.20	40	40	-	-	-	0.4				
16/03/2023	30	0.87	7.00	7.21	39	41	-	-	-	0.4				
17/03/2023	25	0.93	7.00	7.20	40	39	-	-	-	0.4				
Average	**30.4**	**0.848**	**7.004**	**7.204**	**39**	**39.8**			-	**0.4**				
Belonia - Raw and treated water from Muhuri river at WTP														
20/03/2023	47	0.79	6.89	7.13	50	46	0.676	0.276	-	**0.5**			88	80
21/03/2023	45	0.85	6.90	7.17	56	48	0.648	0.273	-	**0.5**			90	74
22/03/2023	43	0.45	6.89	7.09	58	44	0.675	0.281	-	**0.5**			90	76
23/03/2023	40	0.62	6.90	7.05	56	46	0.671	0.256	-	**0.5**			88	78
24/03/2023	40	0.81	6.89	7.09	50	44	0.694	0.247	-	**0.5**			86	80
Average	**43**	**0.70**	**6.89**	**7.11**	**54**	**45.6**	**0.673**	**0.267**	-	**0.5**			**88.4**	**77.6**
National Standards for Drinking Water [a]		**1 (5[c])**		**6.5 – 8.5**		**200 (600[c])**		**0.3**		**0.2**		**500 (2000)**		
WHO Guidelines for Drinking-Water Quality, 4th Edition, 2011[b]										**5**				

Source: DWS of respective towns; Source- DWS, Water Treatment Plant laboratory; [a] Bureau of India Standard 10500: 2012.; [b] Health-based guideline values. [c] Figures in parenthesis are maximum limits allowed in the absence of alternate source.

Results shows that concentration level of parameters in treated water is within the permissible limit, except level of Residual chlorine in Treated water. But at consumer end concentration of residual chlorine will be decreased.

Existing Intake on River Gomati

Existing Intake on River Gomati

Existing WTP

Existing WTP

Photograph of Existing Intake and WTP- Udaipur

Photograph of Intake at Amarpur

Photograph of Existing WTP at Amarpur

Photo of Existing Intake– Melaghar

Photo of Existing Intake – Melaghar

Photo of Existing WTP – Melaghar

Photo of Existing WTP at Melaghar

Existing Intake and WTP at Melaghar

Photo of Existing Intake at Belonia

Photo of Existing Intake at Belonia

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Photograph of Existing WTP at Belonia
Existing Intake and Water Treatment Plant at Belonia

Law, Rules, and Regulations	Description and Requirement	WTP at Udaipur, Amarpur, Melaghar and Belonia
		Y = compliant (if applicable, specify expiration date of permit/clearance) N = non-compliant[15] N/A = not applicable (state justification)
EIA Notification	The EIA Notification of 2006 states that environmental clearance is required for certain defined activities/projects.	N/A Environmental clearance is not required as WTPs are not listed in the EIA Notification's "Schedule of Projects Requiring Prior Environmental Clearance"
Manufacture, Storage, and Import of Hazardous Chemical Rules, 1989	Storage of chlorine (threshold quantity greater than 10 tons but less than 25 tons) in WTPs will require clearance from PESO	N/A Less than 10 tons of Chlorine is stored at WTP required no permit
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments	Consent to operate from TSPCB	N/A CTE and CTO is not required in Tripura for WTP
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	Consent to operate from TSPCB	NA
Environment (Protection) Act, 1986 and CPCB Environmental	Emissions and discharges from the facilities to be created, refurbished, or augmented shall comply with the notified standards.	N/A

[15]Compliant = There is sufficient and appropriate evidence to demonstrate that the particular regulatory requirement has been complied with; non-compliant = clear evidence has been collected to demonstrate the particular regulatory requirement has not been complied with.

Law, Rules, and Regulations	Description and Requirement	WTP at Udaipur, Amarpur, Melaghar and Belonia
		Y = compliant (if applicable, specify expiration date of permit/clearance) N = non-compliant[15] N/A = not applicable (state justification)
Standards	a. Wastewater disposal standards	
Noise Pollution (Regulation and Control) Rules, 2002 amended up to 2010	Applicable ambient noise standards with respect to noise for different areas/zones	Y No source of noise
National Institute of Occupational Safety and Health (NIOSH) Publication No. 2002-149	Compliance with NIOSH Guidance for Controlling Potential Risks to Workers Exposed to Class B Biosolids	N Training and proper PPEs are required
Forest (Conservation) Act, 1980 and Forest Conservation Rules, 2003 as amended	As per Rule 6, every user agency, who wants to use any forest land for non-forest purposes shall seek approval of the central government.	N/A No Component of WTP is in forest land,
Ancient Monuments and Archaeological Sites and Remains Rules of 1959	No development activity is permitted in the "protected area," and all development activities likely to damage the protected property are not permitted in the "controlled area" without prior permission of the Archaeological Survey of India (ASI). Protected property includes the site, remains, and monuments protected by ASI or the State Department of Archaeology.	N/A
The Child Labor (Prohibition and Regulation) Act, 1986	No child below 14 years of age will be employed or permitted to work in any of the occupations set forth in the Act's Part A of the Schedule or in any workshop wherein any of the processes set forth in Part B of the Schedule are present.	Y No children are engaged at WTP site.

Corrective Action Plan

The environmental concerns are mainly related to occupational health and safety, public safety, disposal of debris, discarded materials etc. The sludge management systems of WTP are very old and not functional properly, its need upgradation. Treated water quality rresults shows that each and every parameter of these are well within the permissible limit at Udaipur, Amarpur, Melaghar and Belonia.

No new works are proposed in existing WTPs in this project. The DBO contractor will prepare a service improvement plan and based on the assessment of existing system and the DWS will update these systems including WTP, Intake and report to PMU, PMU must ensure all systems are working properly for existing WTPs. A work specific environmental management plan needs to be prepared for these aspects.

Appendix 7: Drinking Water Standards

Group	National Standards for Drinking Water[a]			WHO Guidelines for Drinking-Water Quality, 4th Edition, 2011[b]	Applicable Per ADB SPS [c, d]
	Parameter	Unit	Max. Concentration Limits[d]		
Physical	Turbidity	NTU	1 (5)	-	1 (5)
	pH		6.5 – 8.5	none	6.5 – 8.5
	Color	Hazen units	5 (15)	none	5 (15)
	Taste and Odor		Agreeable	-	Agreeable
	TDS	mg/l	500 (2,000)	-	500 (2,000)
	Iron	mg/l	0.3	-	0.3
	Manganese	mg/l	0.1 (0.3)	-	0.1 (0.3)
	Arsenic	mg/l	0.01 (0.05)	0.01	0.01
	Cadmium	mg/l	0.003	0.003	0.003
	Chromium	mg/l	0.05	0.05	0.05
	Cyanide	mg/l	0.05	none	0.05
	Fluoride	mg/l	1 (1.5)	1.5	1 (1.5)
	Lead	mg/l	0.01	0.01	0.01
	Ammonia	mg/l	0.5	none established	0.5
Chemical	Chloride	mg/l	250 (1,000)	none established	250 (1,000)
	Sulphate	mg/l	200 (400)	none	200 (400)
	Nitrate	mg/l	45	50	45
	Copper	mg/l	0.05 (1.5)	2	0.05 (1.5)
	Total Hardness	mg/l	200 (600)	-	200 (600)
	Calcium	mg/l	75 (200)	-	75 (200)
	Zinc	mg/l	5 (15)	none established	5 (15)
	Mercury	mg/l	0.001	0.006	0.001
	Aluminum	mg/l	0.1 (0.3)	none established	0.1 (0.3)
	Residual Chlorine	mg/l	0.2 (1.0)	5	0.2
Micro Germs	E-coli	MPN/100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample
	Total Coliform	MPN/100ml			

Note-

[a] Bureau of India Standard 10500: 2012. Value within bracket indicated values permissible limits in absence of alternative source

[b] Health-based guideline values.

[c] Per ADB SPS, the government shall achieve whichever of the standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

[d] Figures in parenthesis are maximum limits allowed in the absence of alternate source.

Appendix 8: Stakeholder Consultations

Summary of Consultation with Stakeholders – Udaipur

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
3rd September 2021	at Ramesh Chowmuhani	05 M=5, F=0	With Honorable Ex-Chairperson, Udaipur Municipal Council, at Ramesh Chowmuhani	• Discussions regarding the inadequate availability of good quality water were shared. • Benefits of the Project was discussed in detail.	• The need for the project components were evident, which could help in overcoming the water issues in various wards. • This project will uplift the wellbeing of the human beings and serve for better health and environment.
19th March 2022	Chanban-Ward no. 01	04 M=3 F=1	Community members	• Briefing on project objectives probable implementation procedures • Present drinking water supply source and its condition- only 1 hours of supply per day • Briefing on project objectives probable implementation procedures • Potential positive and negative impacts due to project implementation • Relevant information of the upcoming project and benefits of the project. • No adverse impacts on structures, livelihoods anticipated. • Construction of assets may cause some public inconveniences for a shorter period	• The area has insufficient and inadequate drinking water supply. The area faces severe water crisis during the summer season when the ground water level drops. • High iron content in drinking water. • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle. • The representative from community raised issue regarding the existing water supply quality is not upto the mark.
19th March 2022	Giridhari Pally-Ward no. 06	9 M=2 F=7	Community members	• Briefing on project objectives probable implementation procedures • Status of existing drinking water supply system • Relevant information of the upcoming project and benefits of the project. • Present drinking water supply source and its condition- only one hour of water supply per day	• Women had heard about the proposed project and welcomed it as women are facing many problems in fetching water for hours. • Some participants did not have water connections. The women were happy to learn about the proposed project • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle.

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
				• Potential positive and negative impacts due to project implementation • Area to be covered under this project	• No adverse impacts on structures, livelihoods anticipated.
19th March 2022	Near Ramesh Boarding, Ward no.-19	9 M=3 F=6	Community members	• Present drinking water supply source and its condition • Need for improvements to present system • Status of existing drinking water supply system • Briefing on project objectives probable implementation procedures • Present water supply situation: only half an hours of supply alternate day	• The area has insufficient and inadequate drinking water supply. Water from two tube wells is presently supplied to the area/community. The area faces severe water crisis during the summer season when the ground water level drops. • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle. • No adverse impacts on structures, livelihoods anticipated.
19th March 2022	N. K. Dutta Lane, Ward no.-19	7 M=5, F=2	Community members	• Briefing on project objectives probable implementation procedures • Need of improvement of the present situation • Potential positive and negative impacts due to project implementation • Land use and area to be covered under the project.	• The area has insufficient and inadequate drinking water supply. • The community welcomed the project and expressed need for it. • On learning about the project, they expressed that they were happy that the entire community would be benefited from the upgraded water supply. • People were briefed about the complaint redress mechanism.
19th March 2022	No-2 Fulkumari, Near WTP, Ward no.-23	8 M=8, F=0	Street vendors and shopkeepers	• Tentative Project implementation period and possible inconveniences during the construction period shared during consultation with community present from the locality. • Detailed discussion about current level of service of Water supply and quality of water. • Shifting of Street vendors. • Shifting or adjusting extended potion of shopkeepers.	• Mobile vendors will be given sufficient notice and assistance to shift to nearby locations, so that they do not face income loss. Mobile street vendors agreed to the proposal. • The area has insufficient and inadequate drinking water supply and high iron content in the drinking water. • Some small restaurant/food stall owners expressed a concern that dust during excavation may fall on / spoil eatables.

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
20th March 2023	Udaipur Municipal Council office	15 M= 13 F= 2	ULB officer	• Briefing on project objectives probable implementation procedures • Present drinking water supply source and its condition- only 3-4 hours of supply per day • Potential positive and negative impacts due to project implementation	• Availability of quality water – 24X7 after completion of project • No impacts on structures, livelihoods anticipated- assurance given • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle.
20th March 2023	Chanban, Housing Board, Ward no- 02	21 M= 12 F=9	Community	• Briefing on project objectives probable implementation procedures • Relevant information of the upcoming project and benefits of the project. • No impact on structure	• Application of mitigation measures in case of impacts • Availability of quality water – 24X7 after completion of project

Figure 86: Public Consultation at Chanban-Ward no. 01

Figure 87: Public Consultation at Giridhari Pallay (Ward no-6)

Figure 88: Public Consultation at Ramesh Boarding (Ward no. 19)

Figure 89: Public Consultation at NK Dutta Lane (Ward No-19)

Figure 90: Public Consultation at Fulkumari (Ward No-23)

Figure 6: Consultation with Honorable Ex-Chairperson of UMC at Ramesh Chowmuhani, Dated- 03-09-2021

Consultation at Udaipur MC office

Community consultation at Chanban Housing Board

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Udaipur Ward No. – 01

Date: - 19/03/2022 Place: - Chanban

Sl No.	Name (in CAPITAL LETTER)	Contact No.	Signature
1	Moni Sutradhar	9856676474	
2	Lakhi Debnath	8414837767	
3	Sankar Bahila	9436470857	
4	Santi Sarkar	6009328119	

List of Participants in Consultation Meeting at Chanban-Ward no. 01

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Udaipur — Ward No. – 06

Date: - 19/03/2022 — Place: - Giridhari Pal

Sl No.	Name (in CAPITAL LETTER)	Contact No.	Signature
1)	Suman Saha	9856744111	Suman Saha
2)	Anita Ghosh	9678224555 37	Anita Ghosh
3	Parbati Shill Saha	9383121 66	parbati Shil Saha
4	Basanti Saha	87948656 81	Basanti Saha
5	Nandita Saha (chakraborty)	9863244506	Nandita Saha (Chakraborty)
6/	Shipra Sarkar.	6009682563	Shipra Sarkar.
7/	Arpita Choudhury.	9862187078	Arpita.
8/	Runu Saha	9862604849	Runu Saha
9/	Kumari Sahar	9862619615	Kumari Sahar

List of Participants in Consultation Meeting at Giridhari Pallay (Ward no-6)

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Udaipur Ward No. - 19

Date: - 19/03/2022 Place: - Near Ramesh Boarding

Sl No.	Name (in CAPITAL LETTER)	Contact No.	Signature
1	Kajol Dutta	9862936998	Kajol Dutta
2	Bina Dutta	—	Bina Datta
3	Baikuntha Bhari Pal	9774510424	Baikuntha Bhari Pal
4	Sukla Chakraborty	9436471133	Sukla Chakraborty
5	Bhramar Som	7005283517	Bhramar Som
6	Namita Saha (Roy)	9436471498	Namita Saha (Roy)
7	Sanjib Datta	8787471229	Sanjib Datta
8	Piyashi Datta	9366906697	Piyashi Datta
9	Tapa Datta	9436368170	Tapa Datta

List of Participants in Consultation Meeting at Ramesh Boarding (Ward no. 19)

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Udaipur

Ward No. - ~~18~~ 19

Date: - 19/03/2022

Place: - N. K. Dutta Lane

Sl No.	Name (in CAPITAL LETTER)	Contact No.	Signature
1)	Debabrata Dey	9862040944	
2)	Sanjib Datta	9436547228	19/3/22
3)	Ratan Majumdar	9436473051	Ratan Majumdar
4)	Bani Rani Dey	9366524957	Bani Rani Dey
5)	Rahul Deb Roy	7005614482	
6)	Soumyadipta Dey	9612281480	Soumyadipta Dey
7)	Bishu Pada Das	8787579976	

List of Participants in Consultation Meeting at NK Dutta Lane (Ward No-19)

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Udaipur Ward No. - 23

Date: - 10/03/2022 Place: - No-2 Fulkumari

Sl No.	Name (in CAPITAL LETTER)	Contact No.	Signature
1	Aptu Saha	8119055971	Apu Saha
2	Liton Deb	9862703778	
3	Cranish Choudhary	6009550648	
4	Shyamol Das	9862071599	Shyamal Das
5	Sukumar Das	9077973267	Sukumar Das
6	Rakhal Debnath	–	
7	Durgas Deb	–	
8	Samir Das	8787532994	Samir Das

List of Participants in Consultation Meeting at Fulkumari (Ward No-23)

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Udaipur Ward No: - 05

Place: - Udaipur ULB office Date: - 20-03-2023

Sl. No.	Name (CAPITAL LETTER)	Male / Female	Contact NO.	Signature
1	Mamata Tolang	F	9425600905	
2	K.S. Chhetri	M	9883137118	
3	Pradip Pal	M	8794021032	
4	MAMITA DEBBARMA	F	8415022347	
5	LITAN CHAKRABORTY	M	9612078224	
6	Er. PARTHA SARKAR	M	9436189753	20/3/23
7	Pradeep Saha	m	8707001669	
8	Sachin Palit	M	9932313841	
9	Vipin Negi	M	9690057783	
10	SUBRATA DEB	m	9485068872	
11	S. K. Basu	M	9830439554	
12	Govind Singh Rathore	M	9560967524	
13	Ardhendu Mitra	M	9830415953	
14	Sourav Seal	M	7980272820	
15	Sujoy Chakraborty	M	7862246728	
16				

Place- Udaipur Municipal Council Office, Dated- 20-03-2023

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Udaipur Ward No: 02

Place: - Chanban, Housing Board Date: - 20-3-2023

Sl. No.	Name (CAPITAL LETTER)	M/F	Contact NO.	Signature
1	Mamita Telang	F	9425680906	Mamita.
2	Govind Singh Rathore	m	9580967524	Govind Singh.
3	Jayanta Chakraborty	M	8761805667	
4	Ardhendu Mitra	M	9830415953	A Mitra
5	[illegible]	m		
6	Mithun Majumder	m	9862163920	Majumder
7	Purnima Sarkar	F	6909440076	Purnima Sarkar
8	Dilip Bumik	m	8837270212	D Bumik
9	Bishnu pada majumder	m	8118935900	Bdas
10	Dulal Bhowmik	m	9862542413	Dulal
11	Mompi Sarkar	F	7005073642	
12	Debasish Nag.	m	8787866185	Nag.
13	Aparna Majumder	F	8787855651	Majumder
14	Bhanu Deb nath	F		
15	[illegible]	F		
16	[illegible]	F		
17	[illegible]	F		
18	[illegible]	F	9862089088	[illegible]
19	Kali [illegible]	m	9831317118	
20	Sucharita Palit	M	9932313841	
21	Pradeep Sarkar	m	8707001669	

Place- Chanban, Housing Board, Ward no- 02, Dated- 20-03-2023

Summary of Focus Group discussion held at Udaipur

Focus-group discussions with affected persons and other stakeholders were conducted to learn their views and concerns. General public and the people residing along the project activity areas were also consulted during visits to the project sites.

Summary Outcome of Consultations

Sl. No	Date	Type of consultation	Location	Total No. of Participants	No. of Female Participants
1	13.09.2021	Focus group discussion	Ward no-10	09	09
2	14.09.2021		Ward No- 11	09	09
3			Ward No- 14	10	10
4	22.09.2021		Ward No- 13	10	10
5			Ward No- 07	09	09
6	23.01.2021		Ward No- 06	10	10
7			Ward No- 03	09	09
8	03.11.2021		Neheru Super Market	05	00
9			Ramesh Chowmuhani	06	00
10			Ramesh Chowmuhani Market	12	00
11			Rajarbagh	04	00
12	19-03-2022	Meeting with project beneficiaries	Chanban, Ward No-1	04	01
13			Giridhari Palli , Ward No- 6	09	07
14			N.K. Datta Lane, Ward No-19	07	02
15			Near Ramesh Boarding, Ward No- 19	09	06
16			Fulkumari, Ward No- 23	08	00
Total				**132**	**82**

Summary Outcome

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
1.	13.09.2021 Ward no-10	09	Discussions were made on present water supply system, hours of supply and quality of water. They were explained about the proposed works and its advantages. They were also informed about the temporary inconveniences during the laying of pipeline, contractors' cooperation.	• The community welcomed the project and expressed need for it. • The area has insufficient and inadequate drinking water supply. The area faces severe water crisis during the summer season when the ground water level drops, and contains high iron content in drinking water. • The willingness of the people for the proposed projects were appreciated.
2.	14.09.2021 Ward No- 11	09	Present status of water supply in the town. The quality of water provided presently, and the duration of supply. Proposed works under this project. Environment and Health impacts of proposed project.	• They expressed their willingness for the proposed water supply works, as they are aware that this will improve health and environmental conditions of the town. • The area has insufficient and inadequate drinking water supply.
3.	14.09.2021 Ward No- 14	10	Present Status of Water Supply in the town and proposed project. Environment & Health impacts of proposed project	• The participants informed that they know about this project and sub projects, and they are willing to provide all types of support during execution of work, as they are aware this will improve the quality of life of the people. • They shared the details of inadequate water supply and extreme crisis during summer months.
4.	22.09.2021 Ward No-13	10	Drinking water problem and discussion about possibility of local disturbances due to Project Construction Work. Water logging and drainage problem if any.	• They expressed their positive cooperation during the project construction period. • They are ready to cooperate with the temporary disturbances, in order to get proper supply of water for

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
				their daily requirements.
5.	22.09.2021 Ward No- 07	09	Present Status of Water Supply in the town and proposed project. Environment & Health impacts of proposed project. Possibility of Local disturbances due to Project Construction Work Water logging and drainage problem.	• The area has insufficient and inadequate drinking water supply. • They are well versed about the advantages of the project and improvement in health and environment. • Ready to cooperate during the construction period.
6.	23.01.2021 Ward No- 06	10	Discussions on potential positive and negative impacts due to project implementation. Present drinking water supply source and its condition- only half an hours of supply per day	• No adverse impacts on structures, livelihoods anticipated. • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle. Mitigation measures will be applied during implementation of the project. • They are concerned about the inadequate water supply conditions of the numerous wards
7.	23.01.2021 Ward No- 03	09	Drinking water problem and discussion about possibility of local disturbances due to Project Construction Work.	• The area has insufficient and inadequate drinking water supply, with high iron content. • They are ready to cooperate during the construction period.
8.	03.11.2021 Neheru Super Market	05	Detailed discussion about current level of service of Water supply and quality of water. Shifting of Street vendors and adjusting extended potion of shopkeepers.	• The area has insufficient and inadequate drinking water supply and high iron content in drinking water. • Mobile vendors will be given sufficient notice and assistance to shift to nearby locations, so that they do not face income loss. Mobile street vendors agreed to the proposal.
9.	03.11.2021 Ramesh Chowmuhani	06	Tentative Project implementation period and possible inconveniences during	• On learning about the project, they expressed that they were happy that the entire community would be

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
			the construction period were discussed. Detailed discussion about current level of service of Water supply and quality of water.	benefited from the upgraded water supply, as they face a lot of issues relating to inadequate supply of water, and quality of water.
10.	03.11.2021 Ramesh Chowmuhani Market	12	Potential positive and negative impacts due to project implementation Briefing on project objectives probable implementation procedures Discussions were made on need of improvement of the present situation.	• The area has insufficient and inadequate drinking water supply. • On learning about the project, they expressed that they were happy that the entire community would be benefited from the upgraded water supply. • People were briefed about the complaint redress mechanism.
11.	03.11.2021 Rajarbagh	04	Potential positive and negative impacts due to project implementation Relevant information of the upcoming project and benefits of the project.	• The representative from community raised issue regarding the existing water supply quality is not upto the mark, so this project will be beneficial for the public. • They also expressed their views on temporary inconveniences, and are ready to cooperate.
12.	19-03-2022 Chanban, Ward No-1	04	Relevant information of the upcoming project and benefits of the project. No adverse impacts on structures, livelihoods anticipated.	• People responded that the area has insufficient and inadequate drinking water supply. They face severe water crisis during the summer season. • No adverse impacts on structures, livelihoods anticipated. •
13.	19-03-2022 Giridhari Palli , Ward No- 6	09	Briefing on project objectives probable implementation procedures.	• People are filled with positivity after hearing the benefits of the project, as the components will lead to betterment of society and developments will lead to a better way of living.
14.	19-03-2022 N.K. Datta Lane, Ward No-19	07	Discussion on the need of improvement of the present situation.	• People shared the hardships they face during summer months. The project is a ray of light, which can overcome the water quality and quality

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
				issues that they face in their daily lives.
15.	19-03-2022 Near Ramesh Boarding, Ward No- 19	09	Potential positive and negative impacts due to project implementation	• The people were well aware of the positive sides of the project and willing to extend their cooperation for it, and they are ready to overcome the temporary inconveniences that are on its way.
16.	19-03-2022 Fulkumari, Ward No- 23	08	Detailed discussion about current level of service of Water supply and quality of water. Tentative Project implementation period and possible inconveniences during the construction period shared during consultation with community present from the locality. Shifting of Street vendors. Shifting or adjusting extended potion of shopkeepers.	• Mobile vendors will be given sufficient notice and assistance to shift to nearby locations, so that they do not face income loss. Mobile street vendors agreed to the proposal. • The area has insufficient and inadequate drinking water supply and high iron content in the drinking water. • Some small restaurant/food stall owners expressed a concern that dust during excavation may fall on / spoil eatables.

Annexure

Photographs of Key Informants Interview and Focus Group discussion

Ward No- 10, Dated- 13-09-2021

Ward No- 11, Dated- 14-09-2021

Ward No- 14, Dated- 14-09-2021

Ward No- 13, Dated- 22-09-2021

Ward No- 07, Dated- 22-09-2021

Ward No- 03, Dated- 23-09-2021

Ramesh Chowmuhani Market, Dated- 03-09-2021

Ramesh Chowmuhani Market , Dated- 03-09-2021

Neheru Super Market, Dated- 03-09-2021

Giridhari Palli, Ward No-06, Dated- 19-03-2022

Near Ramesh Boarding, Ward No- 19, Dated- 19-03-2022

N.K. Datta Lane, Ward no- 19, Dated- 19-03-2022

	
Fulkumari, Ward No- 23, Dated- 19-03-2022	**Chanban, Ward No- 01, Dated- 19-03-2022**

Annexure

Attendance Sheet of Focus Group Discussion (FGD)

Ward - No - 10

FGD UDAIPUR

Sl No.	Name	Occupation	Phone	Sign
1	Payel Dey	House wife	9089083592	Payel Dey
2	Rakela Khatun	House wife	8794784907	Rakela Khatun
3	Hasima Begam	House wife	9862169376	Hasima Begam
4	Marjina Khatun	House wife	7085754307	Marjina Khatun
5	Jamina Begam	House wife	7628828065	762 Jamina Begam
6	Kalpana Begam	House wife	8257008520	8257008520
7	Shilpi Begam	Housewife	9856634521	Shilpi Begam
8	Saraswati Vowel		9436577773	
9	Ranu Das		8259008027	

Ward No-10 (13-09-20221

FGD (UDAIPUR)

Sl.No.	Name	Occupation	Mobile	Signature
1	Arati Banik	house wife	9077210272	
2	Tripti Banik	house wife	9862504993	Tripti Banik
3	[illegible]		9862163206	
4	Piyoshi Saha poddar	housewife	8415071916	Piyoshi Saha poddar
5	[illegible]	housewife	9612015027	[illegible]
6	Gitta Rai Saha	housewife	9131812221	Gitta Rai Saha
7	Arpita Sutradhar	housewife	9612536588	Arpita Sutradhar
8			9612677081	Suchitra Munda (Pau
9	Pinku saha (Podder)		9862187782	Pinku saha (Podd

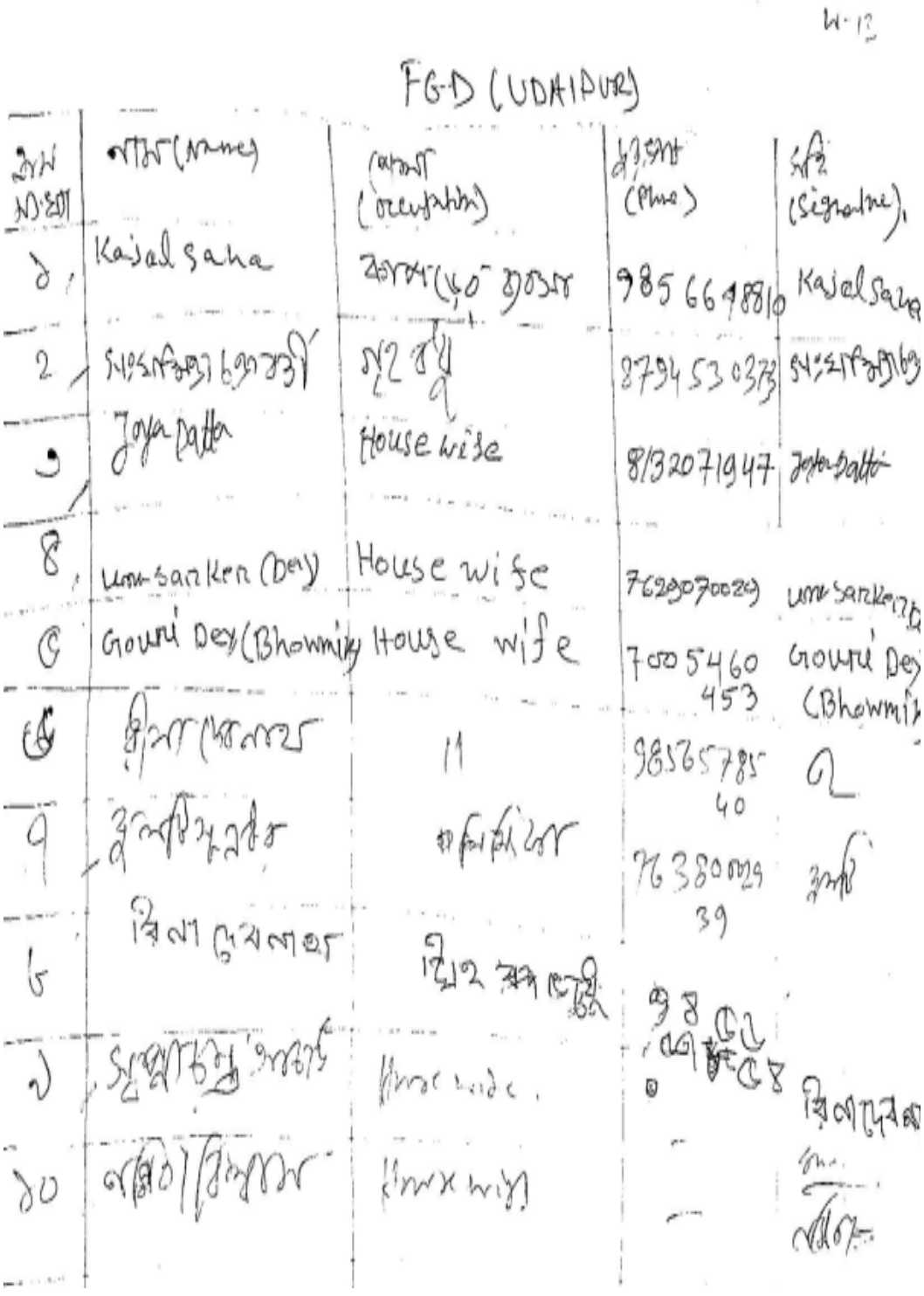
Ward No-11, (14-09-2021)

Ward-14

FGD UDAIPUR.

ক্রম	নাম (Name)	পেশা (occupation)	মোবাইল (Phone)	স্বাক্ষর (Signature)
১.	Aparna Roy (Saha)	R.D. Agent.	9862821455	Aparna Roy (Sa
২	Shilpi Sarkar (Dey)	House wife	9856636462	Shilpi Sarkar
৩	Namita Majumder	11	9774073909	Namita Majumd
৪	Aparna Barman Chakraborty.		8131953858	
৫	Bapi Das		8794352850	
৬	Sabita Das		6909519543	
৭	Mausumi Saha		8258907679	
৮	Mithu Rani Chowdhury		—	
৯	Shila Barman		8131953828	
১০	Nalur Rani Dey Baidya		8729864513	

Ward No- 14 (14-09-2021)



FGD (UDAIPUR)

ক্রম নং	নাম (Name)	পেশা (occupation)	ফোন (Phone)	স্বাক্ষর (Signature)
১	Kajal saha	গৃহবধূ (House wife)	9856698810	Kajal Saha
2	[illegible]	গৃহবধূ	8794530373	[illegible]
৩	Joya Patta	House wife	8132071947	Joya Patta
৪	Uma sanker (Dey)	House wife	7629970029	Uma Sanker
৫	Gouri Dey (Bhowmik)	House wife	7005460453	Gouri Dey (Bhowmik)
৬	[illegible]	11	9856578540	[illegible]
৭	[illegible]	[illegible]	7638009439	[illegible]
৮	[illegible]	[illegible]	[illegible]	[illegible]
৯	[illegible]	House wife	[illegible]	[illegible]
১০	[illegible]	[illegible]	[illegible]	[illegible]

Ward No- 13 (22-09-2021)

W-7

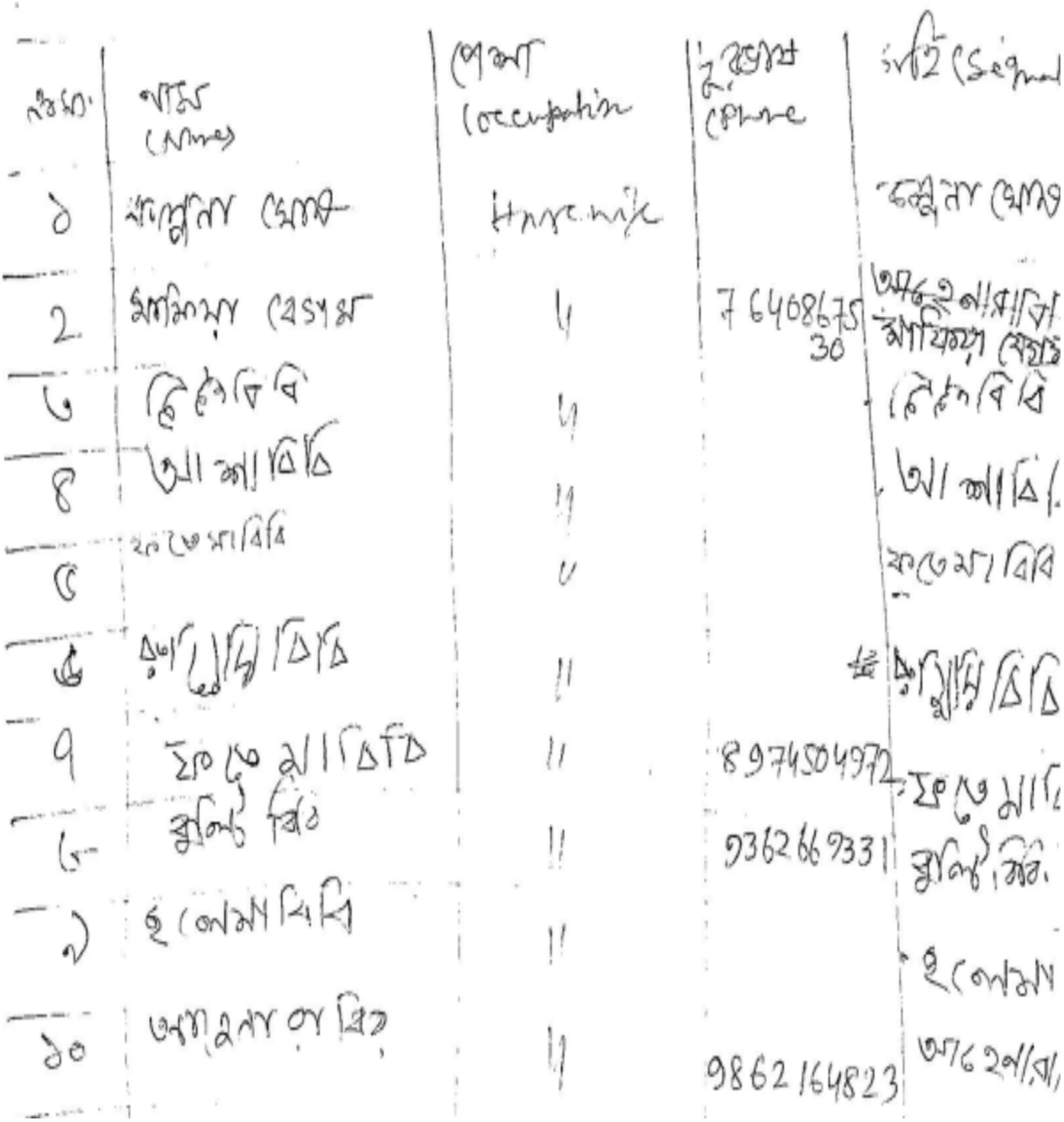
FGD UDAIPUR

PARTICIPANT LIST

Sl No	NAME ([illegible])	OCCUPATION ([illegible])	Phone No ([illegible])	Signature ([illegible])
1				
2				
3	[illegible]	[illegible]		
4	Rinku Baik (Acharjee)	"	9089151673	Rinku Baik (Ac…
5	[illegible]	"	8974776363	
6	Manomi Das Baishnab (Deb nath)		8732073219	Manomi Das Baishnab (Deb…
7	Madhuri Debnath Das Baishnab	[illegible]	8794468998	Madhuri Debnath Das Baishnab
8	Shupi Debnath	"	8837352758	Shupi Debnath
9	[illegible]	"	5909422 025	[illegible]
10	[illegible]	"	9612760912	[illegible]
11	[illegible]	"	8837397778	[illegible]
12	[illegible]	"	9362083280	Rina Das Gupta[illegible]
10				

Ward No- 07 (22-09-2021)

FGD UDAIPUR



Ward No-06, (23-09-2021)

FGD WARD NO - 3 UDAIPUR
GENDER

Sl.no	Name	Occupation	Phone no	Signature
1.	Ajanta Dey (Sarkar)	Jinia SHG	7640983189	Ajanta Dey (Sarkar)
2.	[illegible]	"	7630950160	[illegible]
3.	Mampi Sarkar	"	9366410774	Mampi Sarkar
4.	Uma Banik	"	8974051364	Uma Banik
5	Shibu Rani Saha (Sarkar)	"	8413810925	Shibu Rani Saha (Sarkar)
6.	Mithu Halder	"	9362521136	Mithu Halder
7.	Prita Rani Lodh (Deb)	"	6009781900	Prita Rani Lodh (Deb)
8.	[illegible]	"	9366099575	[illegible]
9.	[illegible]	"		

Ward No- 03, (23-09-2021)

CONSULTATIONS AT AMARPUR

STAKEHOLDER CONSULTATIONS

Summary of Consultation with Stakeholders

Date	Location	No. of Participants	Participants	Topics Discussed	Issues & Perception of community
4th March 2022	Amarpur NP office	6 M=6, F=0	With Honorable Chairperson of Amarpur Nagar Panchayat	Potential positive and negative impacts due to project implementation Relevant information of the upcoming project and benefits of the project.	• They believe the project will uplift the well-being of the human beings and serve for better health and environment in future. • They also expressed their full-time cooperation in any matters needed.
4th March 2022	Amarpur NP office	6 M=6, F=0	Respected SDM of Amarpur	Relevant information of the upcoming project and benefits of the project. No adverse impacts on structures, livelihoods anticipated.	• Time frame of the project was discussed. • The need for the project components were briefly discussed and its impacts were bought into consideration. • They also expressed their full-time cooperation in any matters needed for the execution of the project.
4th March 2022	Amarpur Jail Road, Chandi para, Ward no. 1	6 M=5 F=1	Community members	• Briefing on project objectives probable implementation procedures • Present drinking water supply source and its condition- only one hours of supply per day • Need of improvement of the present situation • Briefing on project objectives probable implementation procedures	• The area has insufficient and inadequate drinking water supply. The area faces severe water crisis during the summer season when the ground water level drops. • The community welcomed the project and expressed need for it. • Short term impact on air quality- dust generation, noise level, access problem,

Date	Location	No. of Participants	Participants	Topics Discussed	Issues & Perception of community
				• Potential positive and negative impacts due to project implementation • Relevant information of the upcoming project and benefits of the project. • Present waste water disposal procedure • In what way they may associate with the project	inconvenience for public and movement of vehicle. • Project area is having sufficient space for worker's camp. Local people will allow to set up labor camp • Present drinking water quality is not good
4th March 2022	Sukumar colony Ward no. 7	6 M=4 F=2	Community members	• Briefing on project objectives probable implementation procedures • Relevant information of the upcoming project and benefits of the project. • Present drinking water supply source and its condition- twice in a day and one hour each time • Potential positive and negative impacts due to project implementation • Dust and noise pollution and disturbances during construction work	• The area has insufficient and inadequate drinking water supply. Water from two water tap is presently supplied to the area/community. The area faces severe water crisis during the summer season when the ground water level drops. • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle. • No adverse impacts on structures, livelihoods anticipated. • Locals only need good and sufficient water
5th July 2022	Sankar Pally, Ward Number-11	8 M=5 F=3	Community members	• Briefing on project objectives probable implementation procedures • Relevant information of the upcoming project and benefits of the project. • Present drinking water supply source and its condition- twice	• The area has insufficient and inadequate drinking water supply. • The area faces severe water crisis during the summer season when the ground water level drops.

Date	Location	No. of Participants	Participants	Topics Discussed	Issues & Perception of community
				in a day and one hour each time • Potential positive and negative impacts due to project implementation • Dust and noise pollution and disturbances during construction work	• High Iron content in drinking water. • locals only need good and sufficient water • No adverse impacts on structures, livelihoods anticipated

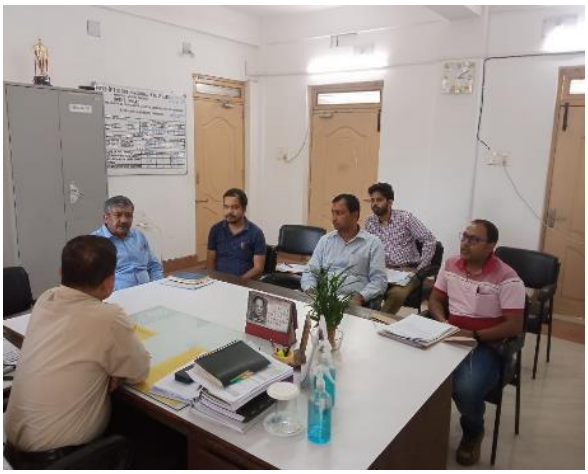
Stakeholder Consultation at Amarpur Jail Road

Stakeholder Consultation at Sukumar colony

Stakeholder Consultation at Sankar Pally


Consultation with Honorable MLA & Respected SDM, Amarpur, Dated- 30-12-2021


Consultation with Honorable Chairperson of Amarpur Nagar Panchayat, Dated- 04-03-2022

Consultation with Respected SDM of Amarpur, Dated- 04-03-2022

List of Participants in Consultation Meeting at Amarpur Jail Road Chandi Para, Ward No-01

LOAN 6027 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - AMARPUR

Ward No. – Ward No. 1

Date: - 04/03/2022

Place: - Chandrapara Jail Road

Sl No.	Name (in CAPITAL LETTER)	Contact No.	Signature
01	Deepak Paswan	7085640519	[illegible]
02	Rabindra Das	8789300284.	Rabindra Das
03.	Subhasish Chakma.	9436478773.	Subhasish Chakma.
04	Sukanta Acharjee	9485485987	Deepak Paswan / Sukanta Acharjee
5.	Nirmal Majumder	8787702951	Nirmal Majumder
6	Simal Sen.	8787646475	Simal Sen

List of Participants in Consultation Meeting at Sukumar colony

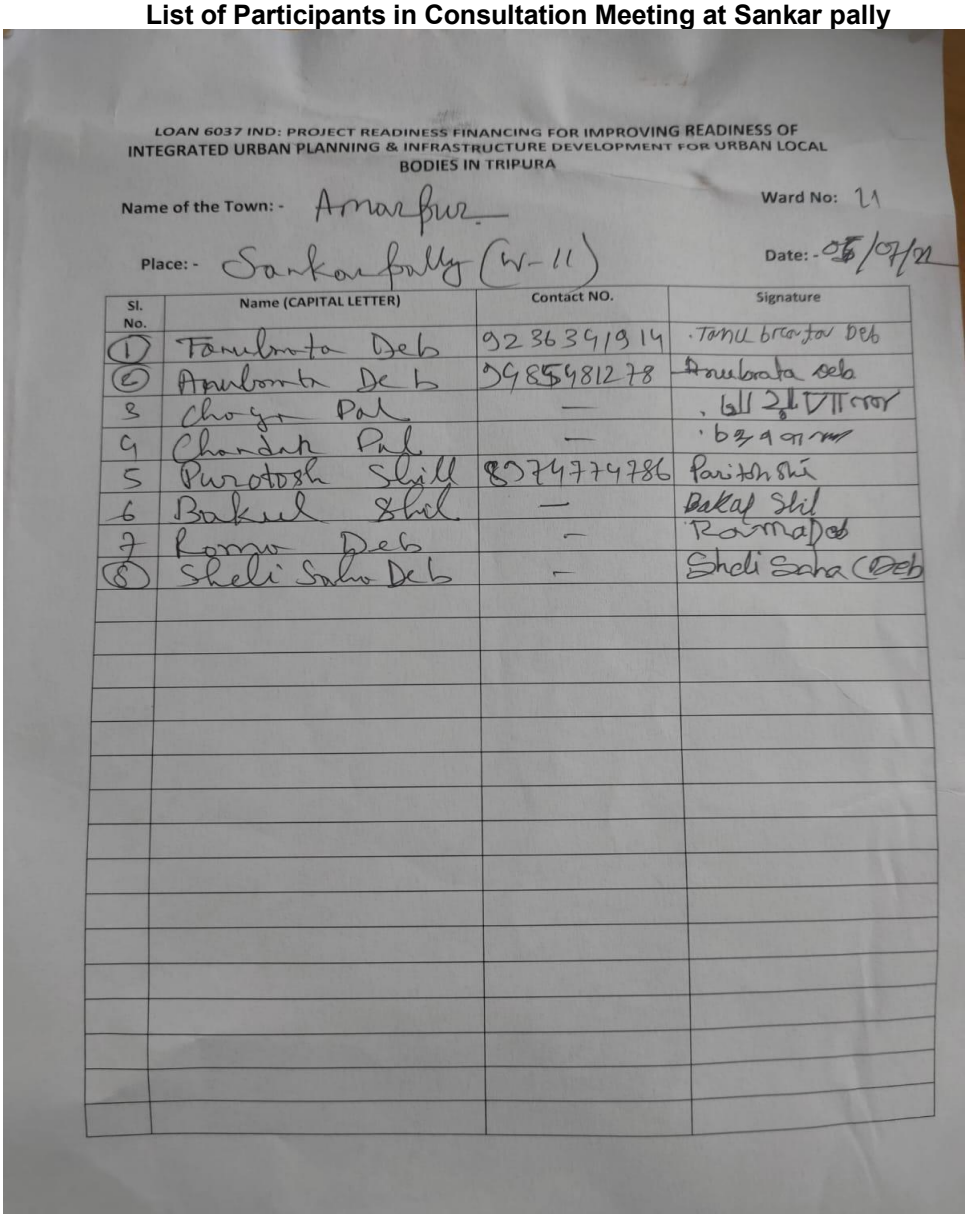
LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - [illegible] **Ward No.** - 7

Date: - 04/03/2022 **Place:** - Sukumar Colony

Sl No.	Name (in CAPITAL LETTER)	Contact No.	Signature
1	[illegible] Saha	9383257291	[illegible]
2	[illegible]	9402153045	[illegible]
3	[illegible]		[illegible]
4	Badal Deb nath	09856102987	[illegible]
5	Akash Saha	8787847686	
6	Uttam Kumar Saha	7431791095	[illegible]

List of Participants in Consultation Meeting at Sankar pally



LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Amarpur Ward No: 11

Place: - Sankarpally (W-11) Date: - 05/07/22

Sl. No.	Name (CAPITAL LETTER)	Contact NO.	Signature
1	Tanubrata Deb	9236349114	Tanu bratar Deb
2	Anubrata Deb	9485481278	Anubrata deb
3	Chayan Pal	—	
4	Chandan Pal	—	
5	Purotosh Shill	8974774786	Paritosh Shil
6	Bakul Shil	—	Bakul Shil
7	Rama Deb	—	Ramadeb
8	Sheli Saha Deb	—	Sheli Saha Deb

Summary of Focus Group discussion and Meeting held at Amarpur

	Date	Type of consultation	Location	Total No. of Participants	No. of Female Participants
1	17.11.2021	Focus group discussion	Near Amarpur Motor stand	05	00
2	30-12-2021		East Bank of Amarsagar	09	00
3	08-02-2022		Chandi Para, Ward no-1	11	11
4			Ward No-2	07	07
5			Ward No-5	11	11
6			Ward No-8	07	07
7	04-03-2022	Meeting with project beneficiaries	Chandi Para, Ward No-1	06	01
8			Sukumar Colony, Ward No- 7	06	02
9	30-12-2021	Meeting	With Honorable MLA, Amarpur at East bank of Amar Sagar	07	00
Total				**69**	**39**

Summary Outcome

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
1.	17.11.2021 Near Amarpur Motor stand	05	Topics of discussion included present water supply system, hours of supply and quality of water. They were explained about the proposed works and its advantages. They were also informed about the temporary inconveniences during the laying of pipeline, contractors' cooperation.	• The people responded positively, and extended their willingness towards the project and expressed the need for it. • The area has insufficient and inadequate drinking water supply. The area faces severe water crisis during the summer season when the ground water level drops, and contains high iron content in drinking water. • Short term impacts, on air quality, dust generation, noise problems and access issues were also discussed and sorted.
2.	30-12-2021 East Bank of Amarsagar	09	Present status of water supply in the town. The quality of water provided presently, and the duration of supply. Proposed works under this project. Environment and Health impacts of proposed project.	• They expressed their willingness for the proposed water supply works, as they are aware that this will improve health and environmental conditions of the town. • The area has insufficient and inadequate drinking water supply.
3.	08-02-2022 Chandi Para, Ward no- 1	11	Present Status of Water Supply in the town and proposed project. Environment & Health impacts of proposed project	• The participants responded that they know about this project and sub projects, and they are willing to provide all types of support during execution of work, as they are aware that this will improve health and environment and in return would serve better quality of living for the people. • They shared the details of of inadequate water supply and extreme crisis during summer months.
4.	08-02-2022 Ward No-2	07	Drinking water problem and discussion about possibility of local disturbances due to Project Construction Work.	• They expressed their positive cooperation during the project construction period. • They are ready to cooperate with the temporary disturbances, in order to get proper supply of water for their daily requirements.
5.	08-02-2022 Ward No-5	11	Present Status of Water Supply in the town and proposed project. Environment & Health impacts of proposed	• The area has insufficient and inadequate drinking water supply. • They are well versed about the advantages of the project and

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
			project. Possibility of Local disturbances due to Project Construction Work Water logging and drainage problem.	improvement in health and environment. • Ready to cooperate during the construction period.
6.	08-02-2022 Ward No-8	07	Drinking water problem and discussion about possibility of local disturbances due to Project Construction Work.	• The area has insufficient and inadequate drinking water supply, especially during the months of summer. • They are ready to cooperate during the construction period.
7.	04-03-2022 Chandi Para, Ward No-1	06	Discussion on project objectives and implementation procedures, present drinking water conditions and need of improvement. Potential positive and negative impacts. Present waste water disposal procedure and how they may be associated with the project.	• The area has insufficient and inadequate drinking water supply and it faces severe water crisis during summer months. • The community expressed their desire for the project. • Short- term impacts like dust generation, noise pollution, access problems, these can be overcome through proper management. • Project area is having sufficient space for worker's camp, local people will allow to set labor camp.
8.	04-03-2022 Sukumar Colony, Ward No- 7	06	Tentative Project implementation period and possible inconveniences during the construction period were discussed. Detailed discussion about current level of service of Water supply and quality of water.	• On learning about the project, they expressed that they were happy that the entire community would be benefited from the upgraded water supply, as they face a lot of issues relating to inadequate supply of water, and quality of water. Water from two water tap is presently supplied to the area/community.
9.	30-12-2021 East bank of Amar Sagar	07	Discussions regarding the inadequate availability of good quality water was shared. Benefits of the Project was discussed in detail.	• The need for the project components were evident, which could help in overcoming the water issues in various wards. s project will uplift the well-being of the human beings and serve for better health and environment in future.

Photographs of Consultation and Focus Group discussion

Near Motor stand, Ward No- 6, Dated- 17-11-2021

East Bank of Amarsagar, Dated- 30-12-2021

Chandi Para, Ward No- 1, Dated- 08-02-2022

Ward No-2, Dated- 08-02-2022

Ward No- 2, Dated- 08-02-2022

Ward No- 8, Dated- 08-02-2022

Chandi Para, Ward No-1, Dated- 04-03-2022

Sukumar Colony, Ward No- 7, Dated- 04-03-2022

Attendance Sheet of Focus Group Discussion (FGD)

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Amarpur Ward Nos. :- 01

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Kanka Dey	01	9863851332	F	Kanka Dey	
2	Sampa Sutradhar (Das)	01	9366267674	F	Sampa Sutradhar (Das)	
3	[illegible]	01	9402115692	F	[illegible]	
4	Namita Das Malakar.	01	9862658727	F	Namita Das Malakar.	
5	Shilpi Bhadra (Dey)	01	8794960955	F	Shilpi Bhadra (Dey)	
6	Mou Chakraborty	12	8837382032	F	Mou Chakraborty	
7	Anjana Das (majumder)	8	9612559120	F	Anjana Das (majumder)	
8	Chandana Saha	01	9485481081	F	Chandana Saha	
9	Pompi Bhattacharjee (Risidas)	01	8033817022	F	Pompi Bhattacharjee (Risidas)	
10	[illegible]	01		F	[illegible]	
11	[illegible]	01		F	[illegible]	

Signature of the respective Surveyor

Raj Kumar Malakar
8119894787

Verified By the respective ULB staff

Name: -
Assistant Town Supervisor
Amarpur Nagar Panchayat
Amarpur, Gomati, Tripura
Signature with Seal

Chandi Para, Ward No-1 (08-02-2022)

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Amarpur

Ward Nos. :- 2

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1.	Mary Majumder (malik)	2	9362533211	F	Mary Majumder (malik)	
2.	Monti Paul	2	9863112009	F	Monti Paul	
3.	Kiran Das	2	9436524480	F	Kiran Das	
4	Rakhi Das	2	8378037680	F	Rakhi Das	
5	Bijaya Das	2	6909951965	F	Bijaya Das	
6	Shikha Rani ghosh.	2	9436477214	F	Shikha Rani ghosh.	
7	Pinki majumder.	2	6033138506	F	Pinki majumder.	

Signature of the respective Surveyor:

Raj Kumar Malakar
8119894787

Verified By the respectiveULB staff

Name: -
Assistant Town Supervisor
Amarpur Nagar Panchayat
Amarpur, Gomati, Tripura.
Signature with Seal: -

Ward No-02, (08-02-2022)

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Amarpur Ward Nos. :- 5

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Purnima Sutradhare (Das)	5	6909431024	F	Purnima Sutradhare (Das)	
2	Sikpria Rani Saha	5	9436156104	F	Sikpria Rani Saha	
3	Biru Rani Pura	5	9436581762	F	Biru Rani Pura	
4	Bappi Das	5	6009827366	F	Bappi Das	
5	[illegible]	5	9362314343	F	[illegible]	
6	[illegible]	5	9366429668	F	[illegible]	
7	Purnima Das.	5	9436548494	F	Purnima Das.	
8	[illegible]	5	9485451031	F	[illegible]	
9	Asha Rani majumder (da)	5	9414839218	F	Asha Rani majumder (das)	
10	[illegible]	5	9862084520	F	[illegible]	
11	[illegible]	5			[illegible]	

Signature of the respective Surveyor

Raj Kumar Malakar
8119894787

Verified By the respectiveULB staff

Name:-
Designation:- Assistant Town Supervisor
Amarpur Nagar Panchayat
Amarpur (Gomati) Tripura
Signature with Seal:-

Ward No- 05 (08-02-2022)

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Amarpur Ward Nos. :- 8

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	[illegible]	8		F	[illegible]	
2	Mallika Das (Ghosh)	8	9485422315	F	Mallika Das (Ghosh)	
3	Uttala Das majumder	8	9436451438	F	Uttala Das majumder	
4	[illegible]	8	9485478661	F	[illegible]	
5	Aparna Debnath	8	9485451073	F	Aparna Debnath	
6	Atanu Debnath	8	8414934430	F	[signature]	
7	Anjana Das (Majumder)	8	9612559120	F	[signature]	

Signature of the respective Surveyor

Raj Kumar Malakar
8119894787

Verified By the respectiveULB staff

Name: -

Designation: Assistant Town Supervisor
Amarpur Nagar Panchayat
Amarpur, Gomati, Tripura.
Signature with Seal: -

Ward No- 08 (08-02-2022)

CONSULTATION AT MELAGHAR

Summary of Consultation with Stakeholders

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
14th November 2022	Chandighar-Ward no. 04	6 M=6 F=0	Community members	• Briefing on project objectives probable implementation procedures • Present drinking water supply source and its condition- only 1 hours of supply per day • Briefing on project objectives probable implementation procedures • Potential positive and negative impacts due to project implementation • Relevant information of the upcoming project and benefits of the project. • No adverse impacts on structures, livelihoods anticipated. • People are willing to cooperate by all means to implement the project successfully	• The area has insufficient and inadequate drinking water supply. The people of Chandighar area face severe water crisis during the summer season when the ground water level drops. • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle. • Waste water discharge in low lying area.
14th November 2022	Chandighar-Ward no. 03, Near proposed OHT site	5 M=3 F=2	Community members	• Briefing on project objectives probable implementation procedures • Relevant information of the upcoming project and benefits of the project. • Present drinking water supply source and its condition- only half an hours of supply per day • Potential positive and negative impacts due to project implementation • Area to be covered under this project	• The area has insufficient and inadequate drinking water supply. The area faces severe water crisis during the summer season when the ground water level drops. • Pond water uses for the domestic use purpose. • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle. • No adverse impacts on structures, livelihoods anticipated.
18th March 2023	Melaghar Municipal Council Office	23 M=17 F=6	Stakeholder Consultation	• Briefing on project objectives probable implementation procedures • Present drinking water supply source and its	• The area has insufficient and inadequate drinking water supply. • Short term impact on air quality- dust

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
				condition- only 1 hours of supply per day • Briefing on project objectives probable implementation procedures • Potential positive and negative impacts due to project implementation • Relevant information of the upcoming project and benefits of the project.	generation, noise level, access problem, inconvenience for public and movement of vehicle. • No adverse impacts on structures, livelihoods anticipated.
18th March 2023	Indiranagar, Ward No-07	10 M=08 F=02	Community Consultation	• Briefing on project objectives probable implementation procedures • Present drinking water supply source and its condition- only 1 hours of supply per day • Potential positive and negative impacts due to project implementation • Area to be covered under this project	• People agree with the proposed water supply works and understand that proposed works will improve health and environmental conditions of town and chances of waterborne diseases will be mitigated at some extent. • People are supportive of the project.
18th March 2023	Indiranagar, Ward No-08,	17 M=08 F=02	Community Consultation	• Discussed about: Present Status of Water Supply in the town. • Proposed works under this project • Quality of present Water Supply • Environment & Health impacts of proposed projects	• People are concerned about the poor water quality issue. • People demanded for the measures of dust suppression during implementation of the project • People are supportive of the project.

Stakeholder Consultation at Chandighar-Ward no. 03

Stakeholder Consultation at Chandighar-Ward no. 04

Stakeholder Consultation at Melaghar Municipal Council Office

Stakeholder Consultation at Indiranagar, Ward No-07

Stakeholder Consultation at Indiranagar, Ward No-08

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Melaghar Ward No. - 4

Date: - 14/11/22 Place: - Chandighar

Sl No.	Name (in CAPITAL LETTER)	Contact No.	Signature
1	Mrichul Chakraborty	9856224390	
2	Ramkrishna Chakraborty	6909840402	
3	Sanjib Barman	9774777409	
4	Tapash Barman	8014058804	Tapas Barman
5	Asish Choudhuri	7429041594	Ashis Choudhury
6	Rana Barman	8014788510	

List of Participants in Consultation Meeting at Chandighar-Ward no. 03

:

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Meloghar. Ward No: 03

Place: - Chandighar Date: - 19/11/22

Sl. No.	Name (CAPITAL LETTER)	Contact NO.	Signature
1	Chandan Pal	9856358113	Chandan Pal
2	Swapan Pal	7085035066	Swapan Paul
3	Gaitri Pal	–	Gayetri Paul.
4	Monika Sen Pal	–	Manikasen Paul
5	Mampi Pal		Mampi Dey

List of Participants in Consultation Meeting at Chandighar-Ward no. 04

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Melaghar Ward No: -

Place: - Melaghar ULB Office Date: - 18/03/23

Sl. No.	Name (CAPITAL LETTER)	Male / Female	Contact NO.	Signature
1.	Anamika Ghosh (Tabrey)	F	9862767662	
2.	SHIBAJYOTI DUTTA	M	9402382285	
3	Sunil Poddar	M	9436330934	
4	K. S. Ghosh	M	9831317118	
5	Govind Singh Rathore	M	9360697524	
6	Mamita Telang	F	9425250906	Mamita
7	Pritam Saha.	M.	9774119382	
8	Bikram Bhattacharjee	M	8787731991	
9	S. K. Basu	M	9830439554	
10.	Dr. ARDHENDU MITRA	M	9830415953	
11	Snehasis Palit	M	9932313841	
12	Kalyan Ash	M	9836328867	
13	C S Sinha	M	9910060789	
14	Vipin Negi	M	9690057783	
15.	Supriya Pal	F	9402342677	Spal
16.	Arpita Sarkar	F	7005012215	

Place- Melaghar Municipal Council Office, Dated- 18-03-2023

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Melaghar Ward No: -

Place: - Melaghar ULB Office Date: - 18/03/23

Sl. No.	Name (CAPITAL LETTER)	Male / Female	Contact NO.	Signature
1.	SHIBAJYOTI DUTTA	M	9402382285	
2	Sunil Poddar.	M	9436330734	
3.	Anamika Ghosh (Pabroy)	F	9362767662	
4	Pritam Saha.	M	9774149382	
5	Mamsha Telang	F	9425600906	
6	Gajind Singh Rathore	M	9360967524	
7	K.S. Ghosh	M	9831317778	

Place- Melaghar Municipal Council Office, Dated- 18-03-2023

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: -

Place: - Indiranagar (Char)

Ward No: - 7

Date: - 18/3/23

Sl. No.	Name (CAPITAL LETTER)	Male / Female	Contact NO.	Signature
1.	Supriya Pal	F	9402342677	SPal
2.	S. K. Basu	M	9830439559	[illegible]
3	[illegible]	m	9856428612	[illegible]
4	[illegible]	m	9612664157	-
5	[illegible]	m		[illegible]
6	Ashis Kr. Bakshi	M	9383064407	Ashis Kr. Bakshi
7	DnRubo Sil	m	9856578299	DnRubo Sil
8	Govind Singh Rathore	M	9560967124	[illegible]
9	K. S. [illegible]	m	9837377118	[illegible]
10	Mancho Elong	F	9428680906	Mancho

Place- Indiranagar, Ward no- 07, Dated- 18-03-2023

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Melaghar

Place: - Indiranagar

Ward No: - 8.

Date: - 18-03-2023

Sl. No.	Name (CAPITAL LETTER)	Male / Female	Contact NO.	Signature
1	Mamuhe Ilang	F	9425605906	Mamuhe
2	Govind Singh Rathore	M	9560967524	[illegible]
3	K.S. G[illegible]	M	9831317118	[illegible]
4	Paritosh Das	m	8258890641	[illegible]
5	[illegible]	m	9362976776	[illegible]
6	Jalil Mieh	m	9615078846	Jalil Mieh
7	Sahanur kazi	m	9774667609	Sahanur Kazi
8	[illegible]	m		[illegible]
9	Abutaher	m		Abutaher
10	Hanufa Begam	f	9774667609	Hanufa Begam
11)	[illegible]	f	"	[illegible]
12)	[illegible]	f	"	[illegible]
13)	[illegible]	f	"	[illegible]
14)	[illegible]	f	"	[illegible]
15)	Jayanta Chakraborty	M	8761805667	[illegible]
16.	Ardhendu Mitra	M	9830415953	A Mitra
17.	S.K. Basu	M	9830439557	[illegible]

Place- Indiranagar, Ward no- 08, Dated- 18-03-2023

Focus Group Discussion - Melaghar

Sl. No	Date	Type of consultation	Location	Total No. of Participants	No. of Male Participants	No. of Female Participants
1	09.03.2022	Focus Group Discussion	Ward No- 1,2,3,4,5	10	02	08
2			Ward No-10,11	08	00	08
3			Ward No- 12,13	07	03	04
4			Ward No- 2, 12,13	06	00	06
Total				**31**	**05**	**26**

Summary Outcome

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
1.	09.03.2022 Ward No- 1,2,3,4,5	10	Discussed on project objectives probable implementation procedures. Present drinking water supply source and its condition- only 1 hours of supply per day Potential positive and negative impacts due to project implementation	• People responded that the area has insufficient and inadequate drinking water supply. The people of Chandighar area face severe water crisis during the summer season when the ground water level drops. • The willingness of the people for the proposed projects were appreciated, as long as the impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle, these are short term, they are ready to cooperate.
2.	09.03.2022 Ward No-10,11		Discussions on relevant information of the upcoming project and benefits of the project. Present drinking water supply source and its condition- only half an hours of supply per day Potential positive and negative impacts due to project implementation Area to be covered under this project	• The area has insufficient and inadequate drinking water supply. The area faces severe water crisis during the summer season when the ground water level drops. • People are in support of the proposed project. • They expressed their willingness for the proposed water supply works, as they are aware that this will improve health and environmental conditions of the town.
3.	09.03.2022 Ward No- 12,13		Benefits of the subproject for the economic and social upliftment of community at large Labour availability in the Project area or requirement of outside labour Possibility of Local disturbances due to Project Construction Work	• The participants informed that they know about this project and sub projects, and they are willing to provide all types of support during execution of work, as they are aware this will improve the quality of life of the people. • The affected persons understood that this venture would be beneficial to the whole community and would spur development in the area. Impacts such as loss of

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
				livelihood were explained to them. They understood the implications and accepted the impacts as being necessary to development. They were willing to shift back where necessary and possible. They assured that whenever the project was implemented, they would ensure full cooperation to the authorities.
4.	09.03.2022 Ward No- 2, 12, 13	6	Drinking water problem and discussion about possibility of local disturbances due to Project Construction Work.	• During consultation it has come out that water quality is good, but pressure of water is less in most of the wards under Melaghar MC. • People responded that they get 3 hours (2times/day) of water supply per day which is sufficient to fulfil their daily needs. They expressed their positive cooperation during the project construction period.

Annexure
Photographs of Key Informants Interview and Focus Group discussion

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Melaghar Ward Nos. :- 12, 3

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Niranjan Das	3	9612331301	M	Niranjan Das	9612331301
2	Shibani Malakar	3	8837442807	F	শিবানী মালাকার	8837442807
3	Jaydip Das	3	9615113616	M	JAYDIP DAS	9615113616
4	Tutan Das	3	9366133502	M	Tutan Das	9366133502
5	Anjana Shil	12	9366511383	F	Anjana Shil	
6	Mamoni Shil	12	8413807291	F	মনি শীল	
7	Sandhyamoni Das	12	9362887311	F	সন্ধ্যারানী দাস	

Rej. Kumar Malakar

Signature of the respective Surveyor

Verified By the respectiveULB staff

Name: - JAYANTA NAMA

Designation:- Community Organizer DAY-NULM

Signature with Seal:- Melaghar Municipal Council Melaghar, Sepahijala, Tripura

Ward No- 1,2,3,4,5

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Melaghar Ward Nos. :- 10,11

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Dulali Sharma Dey	10	9383042648	F	Dulali Sharma Dey	
2	Usha Rani Das	10	8014360331	F	উষা রানি দাস	
3	Anjana Saha	10	9774987550	F	Anjana Saha.	
4	Lakhi Barman	10	9856525473	F	Lakhi Barman	
5	Shilpi Begum	11	9863252658	F	[illegible]	
6	Maya Rani Das	11	9612870635	F	Mayarani Das	
7	Manju Rani Das	11	9774052638	F	Manjurani Das	
8	Radha Rani Sarkar	11	9362344720	F	Radha Rani Sarkar	

Raj Kumar Murasingh

Signature of the respective Surveyor

Verified By the respectiveULB staff

Name:- JAYANTA NAMA

Designation:- Community Organizer
DAY-NULM

Signature with Seal Melaghar Municipal Council
Melaghar, S[illegible]jala, Tripura

Scanned with CamScanner

Ward No- 10,11

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura.

Name of the ULB / G.P. :- Melaghar Ward Nos. :- 1, 2, 4, 5

Sl.no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Mithu Saha	1	8014887200	F		
2	Anju Majumder	1	8794529726	F		
3	Shipra Das	2	9366797451	F		
4	Subhasri Das	2	8777480209	F	Subashi Das	
5	Rina Barman	5	8837318533	F		
6	Kabita Das	5	9362344720	F		
7	Sikha Choudhury	4	9612870335	F		
8	Papiya Das	4		F	Papiya Das	
9	Potul Sarkar	1	9883928362	M	Potul Sarkar	
10	Kholaram pal	1	8730592605	M	Kholaram pal	

Ravi Kumar Malakar
Signature of the respective Surveyor

Verified By the respectiveULB staff
Name:- JAYANTA NAMA
Designation:- Community Organizer DAY-NULM
Signature with Seal Melaghar Municipal Council Melaghar, Sepahijala, Tripura

Ward No- 12,13

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Melaghar

Ward Nos. :- 12, 13, 2

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Basanti Rani Shil	F 12	9856325373	F	Basanti Rani Shil	
2	Saleya Bibi	F 12	6005543398	F	Saleya Bibi	
3	Suma Das Sarkar	13	8837318533	F	সোমা দাস সরকার	
4	Rekha Bala Barman	13	8837132211	F	রেখা বালা বর্মন	
5	Rina Dey	২	8974076129	F	Rina Dey	
6	Pradip Das	২	9612108709	F	প্রদীপ দাস	

Raj Kumar Malakar

Signature of the respective Surveyor

Verified By the respectiveULB staff

Name: - JAYANTA NAMA

Designation: Community Organizer

Signature with Seal: - DAY-NULM Melaghar Municipal Council Melaghar, Sepahijala, Tripura

Ward no 2,12, 13

CONSULTATION AT BISHRAMGANJ

Summary of Consultation with Stakeholders

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
11th November 2022	Veg and Fish Market, Bishramganj-Ward no. 05	9 M=9 F=0	Street vendors and shopkeepers	• Briefing on project objectives probable implementation procedures • Present drinking water supply source and its condition- only 1 hours of supply per day • Potential positive and negative impacts due to project implementation • Relevant information of the upcoming project and benefits of the project. • No adverse impacts on structures, livelihoods anticipated. • People are willing to cooperate by all means to implement the project successfully	• The area has insufficient and inadequate drinking water supply. The people of Ward no-2, 5, 6 and 8 face severe water crisis during the summer season when the ground water level drops. • Iron content is very high on the ground water which is not suitable for drinking purpose • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle. • Waste water discharge in low lying area.
11th November 2022	Ramkrishana Pally, Bishramganj Ward no. 08	9 M=3 F=6	Community members	• Briefing on project objectives probable implementation procedures • Relevant information of the upcoming project and benefits of the project. • Present drinking water supply source and its condition- only half an hours of supply per day • Potential positive and negative impacts due to project implementation • Area to be covered under this project	• The area has insufficient and inadequate drinking water supply. The area faces severe water crisis during the summer season when the ground water level drops. • Pond water uses for the domestic use purpose. • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle.

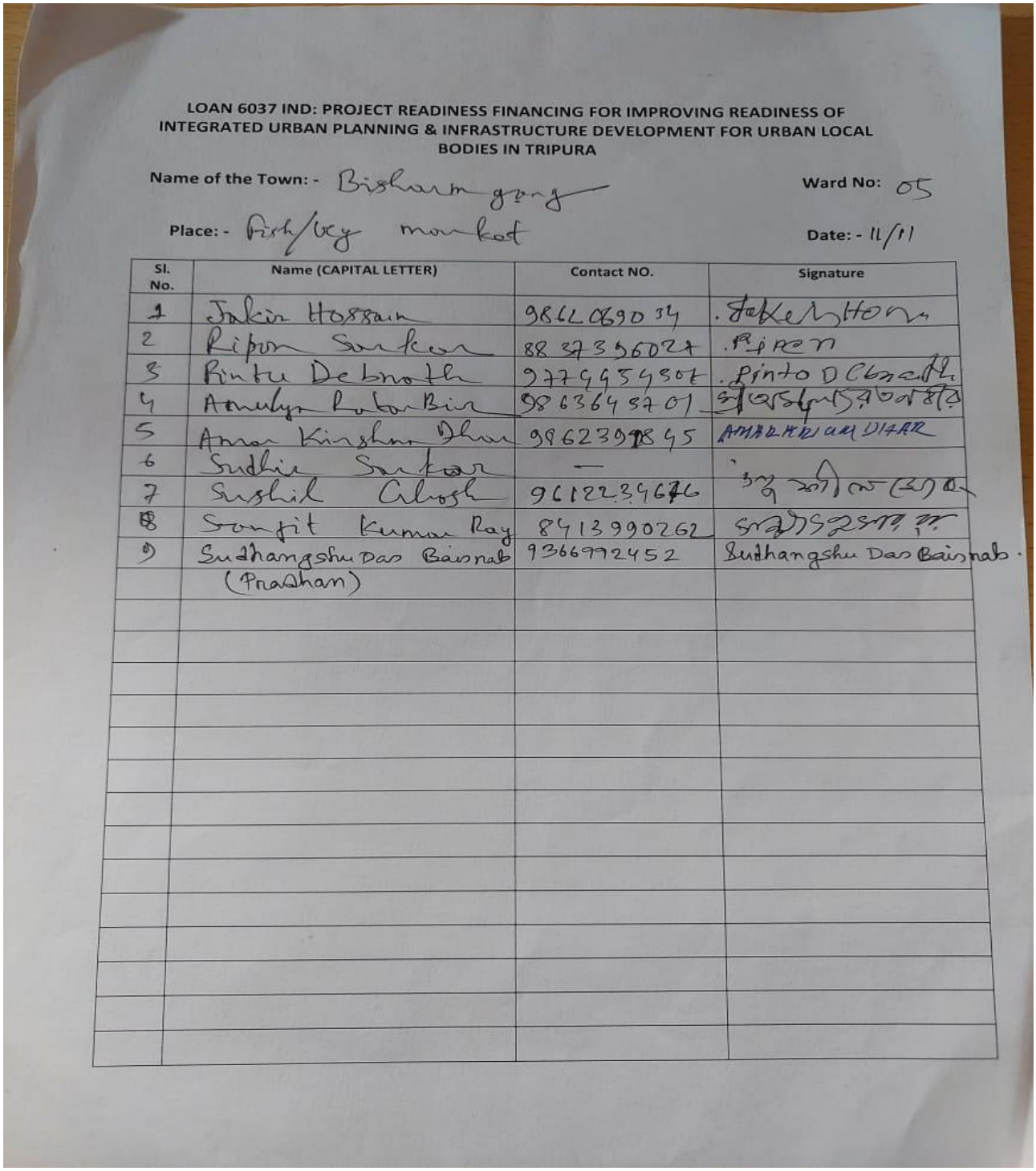
Date	Location	No. of Participants	Participants	Topics Discussed	Issues
					• No adverse impacts on structures, livelihoods anticipated.
11th November 2022	Madhya Barjala, Barjala, Ward no. 03	13 M=4 F=9	Community members	• Briefing on project objectives probable implementation procedures • Status of existing drinking water supply system; • Need for improvements to present system; • Relevant information of the upcoming project and benefits of the project. • Potential positive and negative impacts due to project implementation	• The area has insufficient and inadequate drinking water supply. The area faces severe water crisis during the summer season when the ground water level drops. • Iron content is very high on the ground water which is not suitable for drinking purpose • women had heard about the proposed project and welcomed it as women are facing many problem in fetching water for hours.
10th September 2022	Thalabhanga, Chesrimai, Ward no-01	08 M=7 F=1	Community members	• Briefing on project objectives probable implementation procedures • Status of existing drinking water supply system; • Relevant information of the upcoming project and benefits of the project. • Potential positive and negative impacts due to project implementation	• The area has insufficient and inadequate drinking water supply. Water from two tube wells is presently supplied to the area/community. The area faces severe water crisis during the summer season when the ground water level drops. • Some participants did not have water connections. The women were happy to learn about the proposed project. • The community welcomed the project and expressed need for it.

Stakeholder Consultation at Bishramganj Fish Market

Stakeholder Consultation at Ramkrishana Pally, Bishramganj

Stakeholder Consultation at Madhya Barjala (Ward No.3)

Stakeholder Consultation at Thalabhanga (Ward No.1)



LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Bishramgang — Ward No: 05

Place: - Fish/veg market — Date: - 11/11

Sl. No.	Name (CAPITAL LETTER)	Contact NO.	Signature
1	Jakir Hossain	9862690 34	Jakir Hossain
2	Ripon Sarkar	88 37 396021	Ripon
3	Pinku Debnath	9774954501	Pinku Debnath
4	Amulya Kabir Bir	9863648701	
5	Amar Kishan Dhar	9862398545	AMAR KRISHAN DHAR
6	Sudhir Sarkar	—	
7	Sushil Ghosh	9612234676	
8	Sanjit Kumar Ray	8413990262	
9	Sudhangshu Das Baisnab (Pradhan)	9366992452	Sudhangshu Das Baisnab

:

List of Participants in Consultation Meeting at Ramkrishna pally, Bishramgamj

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Bishramganj Ward No. – 08

Date: - 11/11/22 Place: - Ramkrishna Pally

Sl No.	Name (in CAPITAL LETTER)	Contact No.	Signature
1	Purnima Saha	9774653093	purnima saha
2	Sampa Deb	9612133422	Sampa Deb
3	Shilpi Debnath	8798661952	Shilpi Debnath
4	Putul Debnath	–	পুতুল দেবনাথ
5	Swapna Karmakar	–	স্বপ্না কর্মকার
6	Sabitri Debnath	8837002099	Sabitri Debnath
7	Uttam Karmakar	9862799730	Uttam Kar
8	Ajoy Ghosh	9774729189	Ajoy Ghosh
9	Babul Das	6009061920	Babul Das

List of Participants in Consultation Meeting at Madhya Bargala

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Bisharamganj Ward No. – 03

Date: - 11/11/2022 Place: - Madhya Barjala

Sl No.	Name (in CAPITAL LETTER)	Contact No.	Signature
1)	Bhagyasree Debnath	9862451297	Bhagyasree Debnath
2)	Sujal Debnath	7640931462	Sujal Debnath
3	Dipak Debnath	8794278847	Dipak Debnath
4	Rita Debnath	9862453139	Rita Debnath
5	Swapna Debnath	8787439119	Swapna Debnath
6	Radharani Biswas	-	RadhaRani Biswas
7	Rupa Debnath	8794278847	[illegible]
8	Sumitra Debnath	–	[illegible]
9	Mohima Debnath	9774835439	[illegible]
10	Konika Debnath	–	[illegible]
11	Sumitra Debnath	–	[illegible]
12	Suchitra Debnath	8794107782	[illegible]
13	Sujit Debnath	8837444935	Sujit Debnath

List of Participants in Consultation Meeting at Thalabhanga

Focus Group Discussion – Bishramganj

Sl. No	Date	Type of consultation	Location	Total No. of Participants	No. of Male Participants	No. of Female Participants
1	28.04.2023	Focus Group Discussion	Ward No- 1,2,5,8	7	0	7
2			Ward No-1,2,4,5	7	0	7
3			Ward No- 4	7	0	7
4			Ward No- 2	5	0	5
5	06.09.2022	Focus Group Discussion	Barjala, Near FSTP Site	6	6	0
6	20.10.2022	Focus Group Discussion	Barjala Madhya Para	7	6	1
Total				**39**	**12**	**27**

Summary of Focus Group discussion held at Bishramganj

Focus-group discussions with affected persons and other stakeholders were conducted to learn their views and concerns. General public and the people residing along the project activity areas were also consulted during visits to the project sites.

Summary of Outcome

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
1.	28-04-2022 Ward No-01,02,05,08	07	Detailed discussions were made on present water supply system, hours of supply and quality of water. They were explained about the proposed works and its advantages. They were also informed about the temporary inconveniences during the laying of pipeline, contractors' cooperation.	• The community welcomed the project with positivity and expressed need for it. • During consultation it has come out that the water quality of the area is good but pressure of water is less in most of the wards under Bishramganj, Barjala and Chesrimai Village Panchayat. People responded that they get 1 hour (2times/day) of water supply per day. • The willingness of the people for the proposed projects were appreciated.
2.	28-04-2022 Ward No-01,02,04,05	07	Present status of water supply in the town. The quality of water provided presently, and the duration of supply. Proposed works under this project. Environment and Health impacts of proposed project.	• They expressed their willingness for the proposed water supply works, as they are aware that this will improve health and environmental conditions of the town. • The area has good quality water but the pressure is less, and the duration is insufficient.
3.	28-04-2022 Ward No-04	07	Present Status of Water Supply in the town and	• The participants informed that they know about this project

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
			proposed project. Environment & Health impacts of proposed project. Possibility of Local disturbances due to Project Construction Work.	and sub projects, and they are willing to provide all types of support during execution of work, as they are aware this will improve the quality of life of the people. • They shared the details of water quality which they claimed to be good, but the duration of supply being insufficient.
4.	28-04-2022 Ward No-02	05	Drinking water problem and discussion about possibility of local disturbances due to Project Construction Work.	• The People in the Project areas agreed on the relevance of the Water supply Project. • The community members voiced that the initiative is very relevant so as to improved water supply system in the area as well as maintenance of old pipeline network in the area. • They are ready to cooperate with the temporary disturbances, in order to get proper supply of water for their daily requirements.
5.	06-09-2022 Barjala, Near FSTP Site	06	Potential positive and negative impacts due to project implementation. Briefing on project objectives probable implementation procedures. Discussions were made on need of improvement of the present situation.	• They are well versed about the advantages of the project and improvement in health and environment. • Ready to cooperate during the construction period. • They are very positive about the outcomes of the project, and shared that labour can be locally available if needed, this will improve the economic conditions of the area and increase employment opportunities.
6.	20-10-2022 Barjala Madhya Para Ward No-03	07	Relevant information of the upcoming project and benefits of the project. No adverse impacts on structures, livelihoods anticipated.	• No adverse impacts on structures, livelihoods anticipated. • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle. Mitigation measures will be applied during implementation of the project.

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
				• They are ready to cooperate during the construction period, willing to extend their help, and overcome the temporary inconveniences that are on its way

Focus Group discussion and Stakeholder consultations, Photo and Attendance

Consultation Photo and Signature Sheet
Photographs of Key Informants Interview and Focus Group discussion

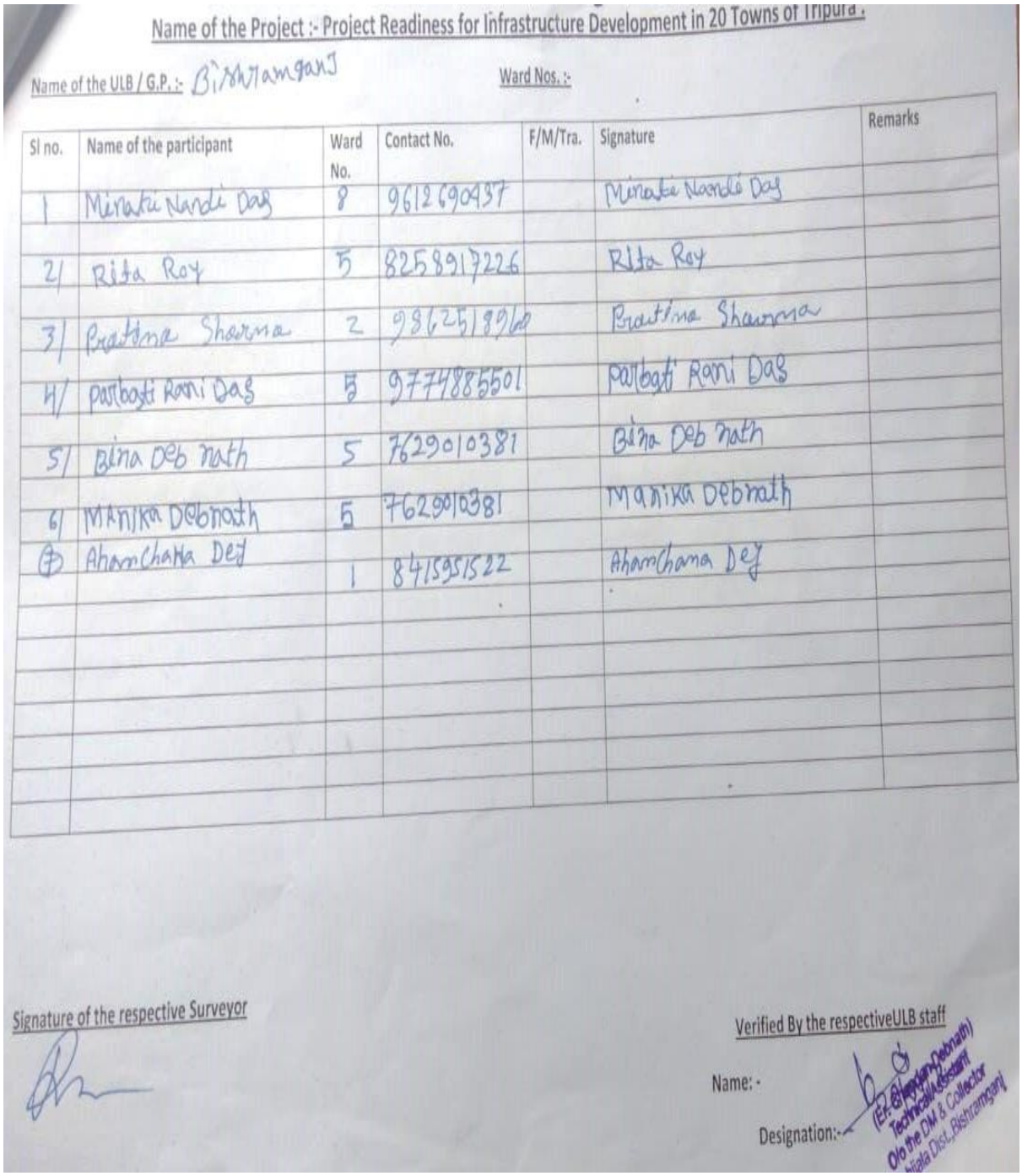
Ward No-01,02,05,08, Dated-28-04-2022
Bishramganj Village Panchayat

Ward No- 01,02,04,05, Dated- 28-04-2022
Bishramganj Village Panchayat

Ward No- 04, Dated- 28-04-2022
Bishramganj Village Panchayat

Ward No- 02, Dated- 28-04-2022
Bishramganj Village Panchayat

Barjala, Near FSTP Site, Dated- 06.09.2022



Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura.

Name of the ULB / G.P. :- Bishramganj

Ward Nos. :-

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Mirata Nandi Das	8	9612690437		Mirata Nandi Das	
2	Rita Roy	5	8258917226		Rita Roy	
3	Pratima Sharma	2	9862518916		Pratima Sharma	
4	Parbati Rani Das	5	9774885501		Parbati Rani Das	
5	Bina Deb nath	5	7629010381		Bina Deb nath	
6	Manika Debnath	5	7629010381		Manika Debnath	
7	Ahamchama Dey	1	8415951522		Ahamchama Dey	

Signature of the respective Surveyor

Verified By the respectiveULB staff

Name: -

Designation:-

(Er. Bhaskar Debnath)
Technical Assistant
O/o the DM & Collector
Sipahijala Dist., Bishramganj

Ward No-01,02,05,08, Dated-28-04-2022 Bishramganj Village Panchayat

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Bishramganj

Ward Nos. :-

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Lipika Debnath	5	9774984384		Lipika Debnath	
2	[illegible]	5	9774082541		[illegible]	
3	Sima Das	2	7005566179		Sima Das	
4	Mithu Dutta	(1)	9862517392		Mithu Dutta.	
5	Swapna Debnath majumder	(1)	9774695059		Swapna Debnath majumder	
6	Swapna DCY	(4)	~~8070557007~~		Swapna DCY	
7	[illegible]	(1)			[illegible]	
8						

Signature of the respective Surveyor

Verified By the respectiveULB staff

Name: -

Designation: -

28/04/22
(Er. Chandan Debnath)
Technical Assistant
O/O the DM & Collector
Unit, Bishramganj

Ward No- 01,02,04,05, Dated- 28-04-2022 Bishramganj Village Panchayat

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura

Name of the ULB / G.P. :- Bishramganj Ward Nos. :-

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1/	Biva Bhakta	4W	7005747664		Biva Bhakta	
2/	Soma Das	4	8119824853		Soma Das	
3/	পুষ্পা রাণী দেববর্মা	4			পুষ্পা রাণী দেববর্মা	
4	জয়শ্রী দেববর্মা	4	7642913217		জয়শ্রী দেববর্মা	
5	Bithi Rani Debnath	4	7642913217		Bithi Rani Debnath	
6.	Mani Deb Nath	4	9862488102		Mani Deb Nath	
7.	Beauti Debnath.	4	8794118421		Beauti Debnath.	

Signature of the respective Surveyor

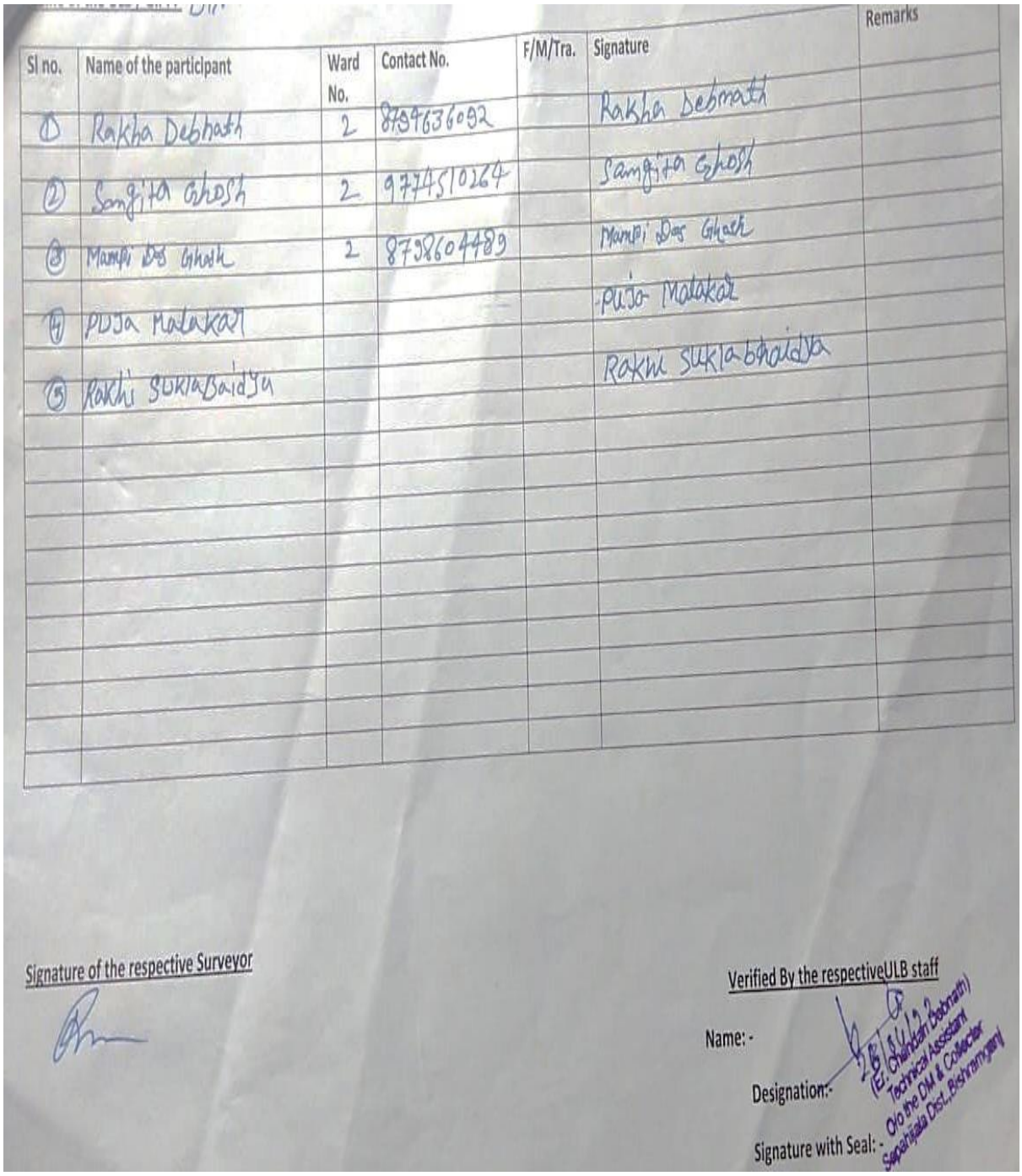
Verified By the respectiveULB staff

Name: -

Designation: 28/04/22

(Er. Chandan Debnath)
Technical Assistant
O/o the DM & Collector
Unakoti Dist., Bishramganj

Ward No- 04, Dated- 28-04-2022 Bishramganj Village Panchayat



Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
①	Rakha Debnath	2	8794636092		Rakha Debnath	
②	Sangita Ghosh	2	9774510264		Sangita Ghosh	
③	Mampi Das Ghosh	2	8798604489		Mampi Das Ghosh	
④	Puja Malakar				Puja Malakar	
⑤	Rakhi Sukla Baidya				Rakhi Sukla Baidya	

Signature of the respective Surveyor

Verified By the respective ULB staff

Name: -

Designation:-

Signature with Seal: -

(Er. Chhaban Debnath)
Technical Assistant
O/o the DM & Collector
Sepahijala Dist., Bishramganj

Ward No- 02, Dated- 28-04-2022 Bishramganj Village Panchayat

LOAN 6037 IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Bishalgarh Ward No:

Place: - Barjala Date: - 06/09/22

Sl. No.	Name (CAPITAL LETTER)	Contact NO.	Signature
1	Nikhil Manjunder	7642009030	
2	Nimai Sarkar	6009152997	
3	Titon Sarkar	8575675527	
4	Subash Saha	8415955053	
5	Topan Sarkar	-	
6	Sibu Sarkar	-	

Barjala, Near FSTP Site, Dated- 06-09-2022

CONSULTATION AT BELONIA

STAKEHOLDER CONSULTATIONS

Summary of Consultation with Stakeholders

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
17th March 2022	Jnanoday English Medium School, Netaji Pally-Ward no. 11	5 M=5 F=0	School Teachers	• Briefing on project objectives probable implementation procedures • Present drinking water supply source and its condition- only 1 hours of supply per day • Briefing on project objectives probable implementation procedures • Potential positive and negative impacts due to project implementation • Relevant information of the upcoming project and benefits of the project. • No adverse impacts on structures, livelihoods anticipated. • People are willing to cooperate by all means to implement the project successfully	• The area has insufficient and inadequate drinking water supply. The students of this school face severe water crisis during the summer season when the ground water level drops. • High iron content in drinking water. • Short term impact on air quality- dust generation, noise level, access problem, inconvenience for public and movement of vehicle. • Waste water discharge in low lying area.
10th Feb 2022	Belonia-Ward no. 12	5 M=1 F=4	Community members	• Briefing on project objectives probable implementation procedures • Relevant information of the upcoming project and benefits of the project. • Present drinking water supply source and its condition- only half an hours of supply per day	• The area has insufficient and inadequate drinking water supply. The area faces severe water crisis during the summer season when the ground water level drops. • Pond water uses for the domestic use purpose. • Short term impact on air quality- dust generation,

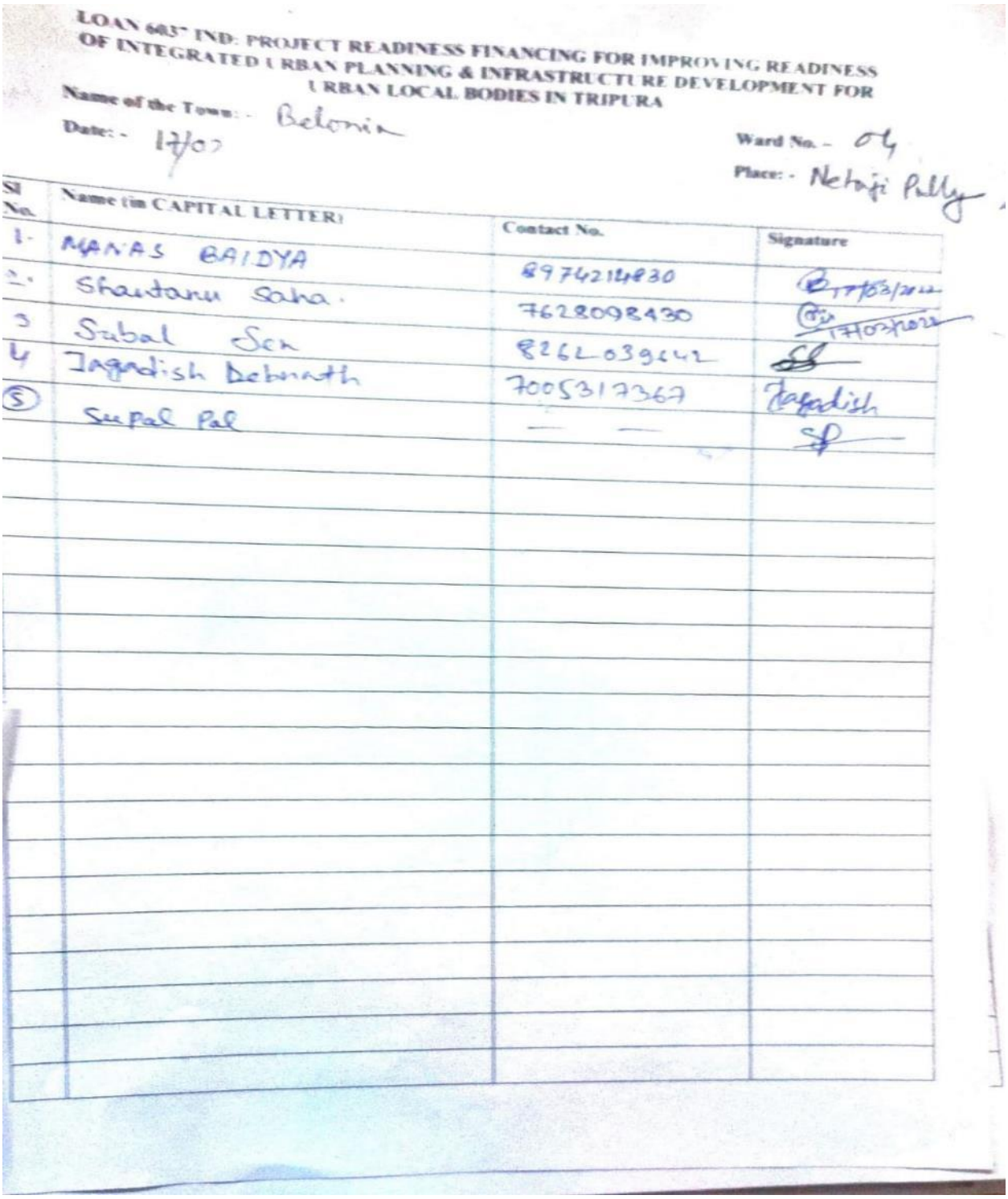
Date	Location	No. of Participants	Participants	Topics Discussed	Issues
				• Potential positive and negative impacts due to project implementation • Area to be covered under this project	noise level, access problem, inconvenience for public and movement of vehicle. • No adverse impacts on structures, livelihoods anticipated.
29.01.2022	ULB Belonia	4 M=4 F=0	Consultation with Honorable Chairperson	• Present drinking water supply source and its condition. Need of improvement of the present situation • Briefing on project objectives probable implementation procedures	• Belonia is operating the water supply system for the town, but capacity to be further built. • The Chairman of the ULB expressed need for the project and willingness to take it up • The prime concern and apprehension of the ULB Chairman regarding the project was whether it will be a financial burden on the MC.
29.01.2022	ULB Belonia	4 M=4 F=0	Consultation with Junior Engineer of DWS Department	• Present drinking water supply source and its condition. Need of improvement of the present situation • Briefing on project objectives probable implementation procedures.	• They expressed need for the project and willingness to take it up • Its operating the water supply system for the town, but capacity to be further built. •
17.03.2022	SDM office Belonia	7 M=7 F=0	Consultation With Respected SDM of Belonia	• Present water supply system, Awareness of the project – including Project Coverage area, • Dust and noise pollution and disturbances during construction work,	• People are concerned about the water quality issue. • People demanded for the measures of dust suppression such as water sprinkler to control dust and noise during construction phase. • People are supportive of the project.
17.03.2022	English School	3 M=3 F=0	Consultation with Teachers of Jnanoday English	• Present Status of Water Supply in the town, Awareness of the project-including Project Coverage area,	• People are supportive of the project and indicated their willingness to participate in the project to make It

Date	Location	No. of Participants	Participants	Topics Discussed	Issues
			Medium School	• Present drinking water problem-quantity and quality	successful (especially women) • People are aware of the proposed Project. • Proposed water supply works will provide good and sufficient quantity of water, which will save time and energy of people present spent to collect water from existing supply

Stakeholder Consultation at Jnanoday English Medium School

Stakeholder Consultation at Ward no. 12

Consultation with Honorable Chairperson of Belonia Municipal Council, Dated- 29-01-2022	Consultation with Respected CEO and Honorable Chairperson of Belonia Municipal Council, Dated- 17-03-2022
	
Consultation with Junior Engineer of DWS, Dated- 29-01-2022	**Consultation with Teachers of Jnanoday English Medium School, Dated- 17-03-2022**



LOAN 603* IND: PROJECT READINESS FINANCING FOR IMPROVING READINESS OF INTEGRATED URBAN PLANNING & INFRASTRUCTURE DEVELOPMENT FOR URBAN LOCAL BODIES IN TRIPURA

Name of the Town: - Belonia

Date: - 17/07

Ward No. - 04

Place: - Netaji Pally

Sl No.	Name (in CAPITAL LETTER)	Contact No.	Signature
1.	MANAS BAIDYA	8974214830	
2.	Shantanu Saha.	7628098430	
3	Subal Sen	8261039642	
4	Jagadish Debnath	7005317367	Jagadish
5	Sudal Pal	— —	

List of Participants in Consultation Meeting at Jnanoday English Medium School

Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Belonia Ward Nos. :- 12

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
	Ratan Paul	12	9612842146	M	Ratan Paul	
	Antaripa Paul	12	9863728663	F	Antaripa Paul	
	Rima Deb (Pal)	12	9612842146	F	Rima Deb (Pal)	
	Dipika Datta (Paul)	12	8974203612	F	Dipika Datta (Paul)	
	Tapasree paul	12	6909802831	F	Tapa Sree paul	
		12				

Signature of the respective Surveyor

Rajkumar Murasing

10/2/2022

Verified By the respectiveULB staff

Name: Community organiser
Belonia Municipal Council
Belonia, South Tripura

Designation:-

Signature with Seal: -

List of Participants in Consultation Meeting at Ward no. 12

Summary of FGD & Meeting at Belonia

Sl. No	Date	Type of consultation	Location	Total No. of Participants	No. of Male Participants	No. of Female Participants
1	18.11.2021	Focus Group Discussion	Vidyasagar Market, Bankar	16	16	00
2			Behind Night Angle Shelter House	04	04	00
3			Infront of Amlapara Lake	06	06	00
4	29.01.2022		Hall Chowmuhani	04	04	00
5			Kali Nagar Motor Stand	04	04	00
6			College Square	06	06	00
7			Near Check Post	11	11	00
8			Infront of Govt. Food Godown	04	04	00
9			Infront of English Medium School	05	05	00
10			Vidyapith Corner	04	04	00
11	05.02.2022		Ward No- 01	08	00	08
12			Ward No- 12	05	01	04
13	06.02.2022		Ward No- 13	07	00	07
14			Ward No- 14	05	00	05
15	17.03.2022	Meeting with project beneficiaries	Netaji Palli	05	05	00
Total				**94**	**65**	**24**

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
1.	18.11.2021 Vidyasagar Market, Bankar Behind Night Angle Shelter House Infront of Amlapara Lake	Total-16 M-16, F-0 Total-04 M-04, F-0 Total-06 M-06, F-0	Discussion was made on present water supply system, hours of supply and quality of water. They were briefed about the project, ADB safeguard framework and likely proposed project interventions (w/s, Drainage, SWM and other urban amenities). They were explained about the proposed works and its advantages. They were also informed about the temporary inconveniences during the laying of pipeline, contractors' cooperation.	• The local people are very enthusiastic and energetic. • They expressed their interest to cooperate for the betterment of the society and environment. • The willingness of the people for the proposed projects were appreciated.
2.	29.01.2022 Hall Chowmuhani Kali Nagar Motor Stand College Square Near Check Post Infront of Govt. Food Godown Infront of English Medium School Vidyapith Corner	Total-04 M-04, F-0 Total-04 M-04, F-0 Total-06 M-06, F-0 Total-11 M-11, F-0 Total-04 M-04, F-0 Total-05 M-05, F-0 Total-04 M-04, F-0	Present status of water supply in the town. The quality of water provided presently, and the duration of supply. Proposed works under this project. Environment and Health impacts of proposed project.	• People are in support of the proposed project. • They expressed their willingness for the proposed water supply works, as they are aware that this will improve health and environmental conditions of the town.
3.	05.02.2022 Ward No- 01	Total-08 M-08, F-0	Present Status of Water Supply in the town and proposed project.	• The participants informed that they know about this project and sub projects, and they are willing to provide all

Sl no.	Date and place of consultation	Persons consulted	Topics discussed During consultation	Outcome of Consultations
	Ward No- 12	Total-05 M-05, F-0	Environment & Health impacts of proposed project	types of support during execution of work, as they are aware this will improve the quality of life of the people.
4.	06.02.2022 Ward No-13 Ward No- 14	Total-07 M-07, F-0 Total-05 M-05, F-0	Drinking water problem and discussion about possibility of local disturbances due to Project Construction Work. Water logging and drainage problem if any.	• Some of wards get 30 mints of water supply per day which is not sufficient to fulfil their daily needs as pressure of water is also very less. • They expressed their positive cooperation during the project construction period. • Appreciated the drainage part of the project and voiced it as relevant.
5.	17.03.2022 Meeting with project beneficiaries at Netaji Palli	Total-05 M-05 F-0	Discussed about present water supply system and its quality & proposed works and its advantages, their willingness to project work, temporary inconveniences during pipe laying works, contractor's cooperation, willingness to pay for sustainability of the project	• People are supportive of the project. • People are agree with the proposed water supply works and understand that proposed works will improve health and environmental conditions of town and chances of waterborne diseases will be mitigated at some extent.

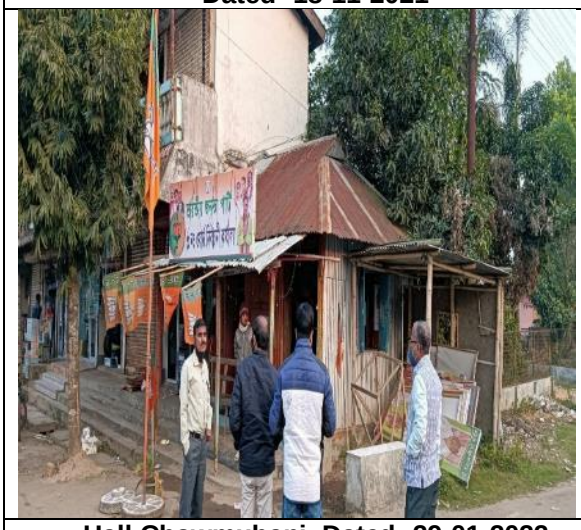
Photographs Key Informants Interview and Focus Group discussion

Vidyasagar Market, Bankar, Dated- 18-11-2021

Vidyasagar Market, Bankar, Dated- 18-11-2021

Behind Night Angle Shelter House, Dated- 18-11-2021

Infront of Amla Para Lake, Dated- 18-11-2021



Hall Chowmuhani, Dated- 29-01-2022

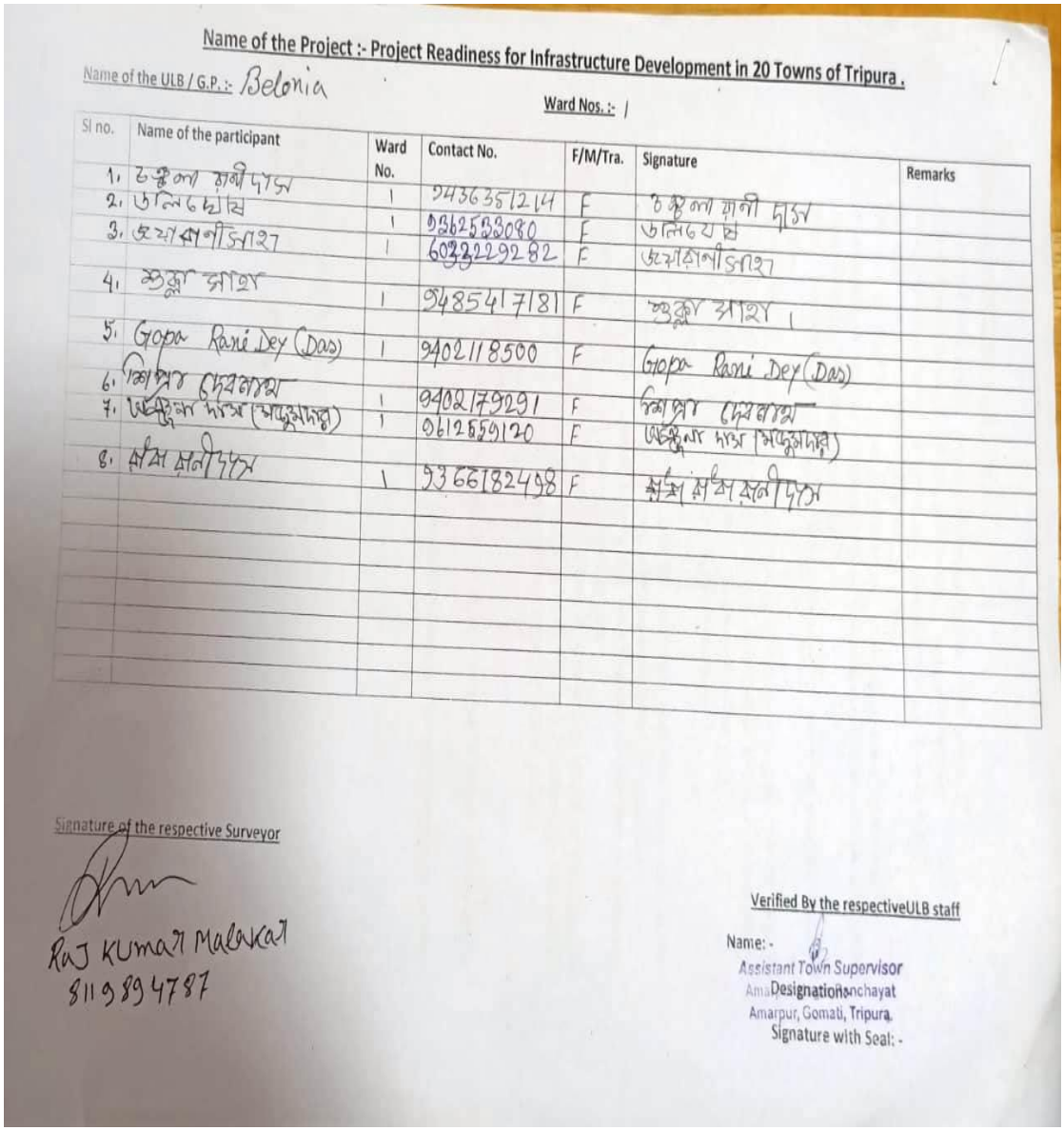
Kalinagar Motor stand, Dated- 29-01-2022

	
College Square, Dated- 29-01.2022	**Infront of Belonia Govt. English Medium School, Dated- 29-01-2022**
	
Near India- Bangladesh Check Post, Dated- 29-01-2022	**Infront of Government Food Godown, Dated- 29-01-2022**
	
Ward No- 13, Dated- 06-02-2022	**Ward No-14, Dated- 06-02-2022**

	
Netaji Palli, Dated- 17-03-2022	**Madhya Para, Dated-17-03-2022**

Attendance Sheet of Focus Group Discussion (FGD)

Ward No-01 (05-02-2022)



Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Belonia

Ward Nos. :- 1

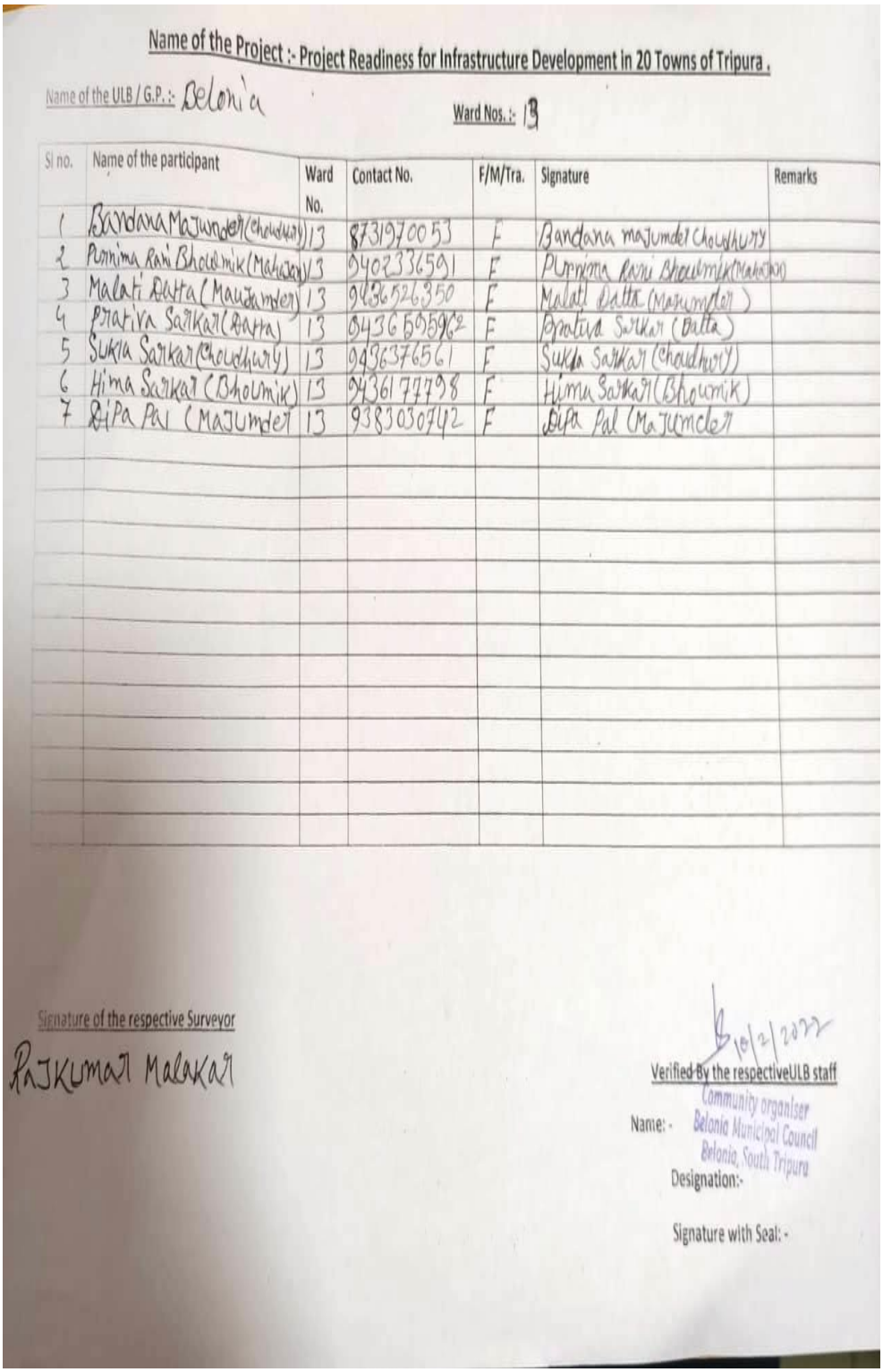
Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1.	ঊষ্ণা রানী দাস	1	9436351214	F	ঊষ্ণা রানী দাস	
2.	ঊলি ঘোষ	1	9625533080	F	ঊলি ঘোষ	
3.	ঊমা রানী ডাস	1	6033229282	F	ঊমা রানী ডাস	
4.	শুক্লা আইচ	1	9485417181	F	শুক্লা আইচ	
5.	Gopa Rani Dey (Das)	1	9402118500	F	Gopa Rani Dey (Das)	
6.	ঝিপ্রা দেবনাথ	1	9402179291	F	ঝিপ্রা দেবনাথ	
7.	ঊষ্ণা দাস (মজুমদার)	1	9612659120	F	ঊষ্ণা দাস (মজুমদার)	
8.	শ্রীমা রানী দাস	1	9366182498	F	শ্রীমা রানী দাস	

Signature of the respective Surveyor

Raj Kumari Malakar
8119894787

Verified By the respectiveULB staff

Name: -
Designation: Assistant Town Supervisor
Amarpur Nagar Panchayat
Amarpur, Gomati, Tripura.
Signature with Seal: -



Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Belonia

Ward Nos. :- 13

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Bandana Majumder (Choudhury)	13	8731970053	F	Bandana majumder Choudhury	
2	Purnima Rani Bhoumik (Mahajan)	13	9402336591	F	Purnima Rani Bhoumik (Mahajan)	
3	Malati Datta (Majumder)	13	9436526350	F	Malati Datta (Majumder)	
4	Prativa Sarkar (Datta)	13	8436595962	F	Prativa Sarkar (Datta)	
5	Sukla Sarkar (Choudhury)	13	9436376561	F	Sukla Sarkar (Choudhury)	
6	Hima Sarkar (Bhoumik)	13	9436177798	F	Hima Sarkar (Bhoumik)	
7	Dipa Pal (Majumder	13	9383030742	F	Dipa Pal (Majumder	

Signature of the respective Surveyor

Rajkumari Malakar

10/2/2022

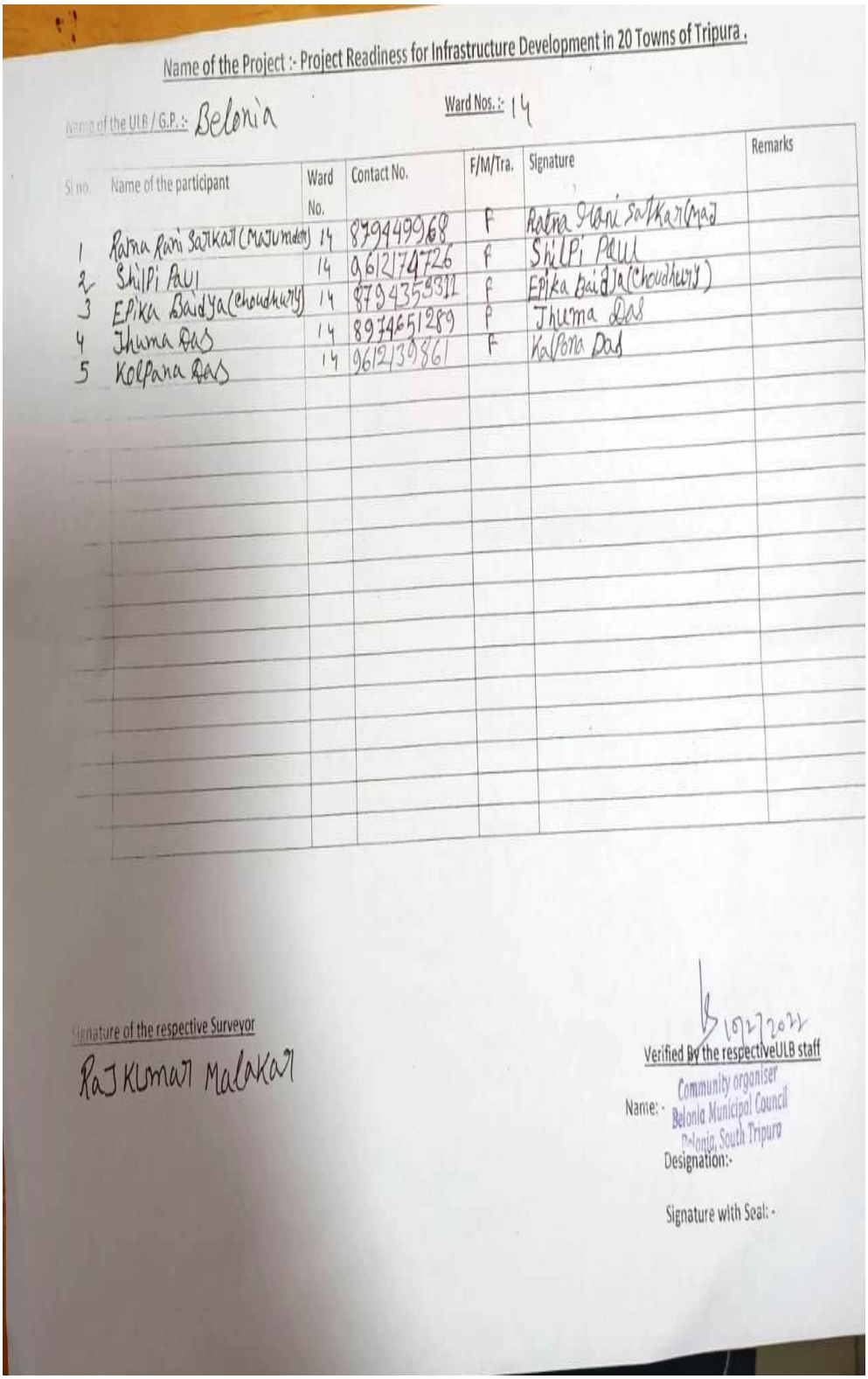
Verified By the respective ULB staff

Name:- Community organiser Belonia Municipal Council Belonia, South Tripura

Designation:-

Signature with Seal:-

Ward No- 13 (06-02-2022)



Name of the Project :- Project Readiness for Infrastructure Development in 20 Towns of Tripura .

Name of the ULB / G.P. :- Belonia Ward Nos. :- 14

Sl no.	Name of the participant	Ward No.	Contact No.	F/M/Tra.	Signature	Remarks
1	Ratna Rani Sarkar (Majumder)	14	8794499668	F	Ratna Rani Sarkar(Maj	
2	Shilpi Paul	14	9612174726	F	Shilpi Paul	
3	Epika Baidya(Choudhury)	14	8794359311	F	Epika Baidya(Choudhury)	
4	Jhuma Das	14	8974651289	F	Jhuma Das	
5	Kalpana Das	14	9612139861	F	Kalpana Das	

Signature of the respective Surveyor

Raj Kumar Malakar

10/2/2022

Verified By the respectiveULB staff

Name: - Community organiser Belonia Municipal Council Belonia, South Tripura

Designation:-

Signature with Seal: -

Ward No-14, (06-02-2022)

INTERACTIVE WORKSHOP – ENVIRONMENT , SOCIAL SAFEGUARD- PART OF

PRF Tripura Urban and Tourism Development Project (TUDDP)

Report of Orientation Workshop on ADB Safeguards Policy- Finance – Procurement – Institutional Arrangements for the Officials of Tripura Urban Planning and Development Authority (TUDA) & Project ULBs

Introduction

Government of Tripura initiated the Project Readiness Financing (PRF) of Integrated Urban Planning & Infrastructure Development for Urban Local Bodies in 20 towns[1] of the State under the loan no. 6037-IND assisted by the Asian Development Bank (ADB). The aim of the project is to plan, develop, implement and manage project activities and infrastructure assets for sustainable development and economic growth of the state as a whole. The project has two components viz URBAN and TOURISM. Urban infrastructure is looked after by TUDA whereas the Tourism part is under the TTDCL. The Urban Infrastructure Development subprojects are spread over 5 major components like Water supply, Storm water drainage, Septage management, Roads and Urban Amenities.

To achieve the project objectives efficiently, capacity building of the engineering and other non-engineering stakeholders is an inevitable part of the project. In the initial stage of preparation of DPR, Bid document and prior to the floating of tenders, DPR preparation and floating of tender documents, the technical and non-technical stakeholders, who are supposed to be directly or indirectly involved the Subprojects at all level needs to be oriented on the project prerequisites like, Safeguards Policy and measures to be followed, Financial modalities of externally aided projects, Procurement, Institutional arrangement structure etc. so as to enable project executing staffs to have a better understanding in discharge their roles and duties in a better way for assured quality services.

In this regard, a two days' workshop was organized with the joint effort of TUDA and PDMC where officials from all twenty project towns, TUDA and UDD have participated. The primary intent of the orientation workshop was to enhance the knowledge base of the ULB officials, TUDA officials and officials of UDD on the mentioned five disciplines, namely, a) Social safeguard, GRM and Gender, b) Environmental safeguards c) Financial modalities of externally aided projects, d) Procurement procedures, and e) Institutional arrangements.

Objective of the workshop

The specific objective of the workshop is to raise awareness on risks/issues, implications and arrangements of this project across various disciplines and creating a pathway to establish safeguard framework/plan and application of tools customizing to local conditions.

- The participants from ULBs and TUDA have a better understanding of the prerequisite parameters of an externally aided project
- Participants will be able to learn the process of continuous monitoring of the prerequisite parameters of safeguards, procurement process, contract management, financial implications, and institutional arrangements
- Avoid adverse impacts resulting from the project on environment and affected people, where ever possible
- Minimizing, mitigate and / or compensate for adverse project impacts on the environment and persons affected if efforts to avoid adverse impacts if not possible
- Helping borrowers / clients to strengthen the safeguard systems and build the capacity to manage social and environmental risks

- ❖ Reflect on their own supervision approach in a comprehensive perspective
- ❖ Exchange experiences or new ideas for guidance and suggestions to be used in the project
- ❖ Other objectives for the Orientation Workshop are to make the organization for creating a Field of Preparation.

Location and period of the workshop

The mentioned workshop was a residential workshop and was organized at Gitanjali Guest House, Bholagiri, Agartala. The workshop was organized for two days **19th and 20th December 2022**

Total number of participants

The total number of participants were approximately 52 for the two days orientation workshop, comprising of 2 officials each from 20 ULBs and officials from TUDA/UDD.

Methodology of the workshop

The proposed orientation workshop has been conducted mostly in an interactive communication mode. The methodology followed during the orientation workshop are as under:

- ❖ Lecture
- ❖ Presentation
- ❖ Group discussions
- ❖ Subject related learning games etc.

Training Team & Organizing Team

The members of the organizing team comprised of Subject Experts and other support staffs of TUDA – PDMC including Social Safeguard Expert, Environmental Expert, Institutional Expert, Procurement and Finance Expert.

Outcome

The outcome of the two days “Orientation Workshop” related to the understanding of the participants. The outcomes are as under:

- Participants understood the different policies, procedures of Social & Environmental Safeguards
- Importance of social and environmental safeguards,
- Why gender in projects and basics of gender,
- Participants could also have an idea of the modalities of Institutional setups within the project
- Municipal Administration System
- Overview of urban scenario in Tripura
- Participants have learned Project accounting system under ADB and disbursement modalities
- Participants were made aware of the various Stages of procurement
- Types of procurement
- Methods of procurement under ADB project

Session Details – Day One

Session 1: Opening Session

The opening session is intended to welcome the participants and the trainer and the participants to get to know each other. The opening session was addressed by Dr. Tamal Majumder (TCS), Director, UDD, in which he welcomed all the participants and explained the importance of orientation workshop and the specific subjects as well. The opening session was followed by an address regarding the importance and prerequisites in ADB funded projects by Dr. A.K. Aditya, Team Leader, PDMC. After the opening session, participants were addressed and educated regarding ADB Protocols and Guidelines by Mr. M. K. Gop. The

session also provided a brief overview of the whole designed workshop schedule - the back ground, objectives, content and schedule of the course and highlights about the training methodology. The session was conducted in an interactive in nature.

manner and was more oriented towards learning from each other. The course handouts and reading materials are disseminated.

Session 2: Development Induced Social Issues, Social Safeguards & Impacts

The second session was intended to create an understanding of social impacts in implementation of urban infrastructure and development projects in urban areas and their positive and negative implications. It also aimed planners, implementors and decision makers to understand how and when to diagnose the social issues in the process of planning and designing infrastructure projects. The session was designed to assist the participants in distinguishing between “project benefitted people” and “project affected people” through discussions based on identified possible social issues due to urban infrastructure projects based on their experience. During the session, presentations were made deriving from national experience to supplement the learning efforts. It was discussed that development induced social issues will be inevitable unless appropriate social safeguards are not included into infrastructure development plans. This session was the foundation to understand the concept of social safeguards, grievance redressal mechanism and gender related issues and mainstreaming. The said session was so designed that a high level of active participation of the participants was observed although the session. The topics discussed under the session are as under:

- Understanding of Social Safeguard and its principles
- ADB’s Safeguard Policy, 2009 & Scope of application
- Safeguard requirements 2 and safeguard requirements 3
- Policy Objectives & Scope of Policy application
- Understanding Involuntary Resettlement
- Eligible displaced persons & types of displacements
- Basic IR Principles
- Negotiated Land Acquisition
- Categorization of Projects
- IR Impacts, types and categorization of the same
- Who are Indigenous People (IP)
- Safeguards Compliance Flowchart
- IR impacts – what to consider?
- Grievance Redressal Mechanism (GRM / GRC) Structure & ADB’s Accountability Mechanism
- Project stages for preparation of safeguard documents
- Case sharing for best practices of safeguard application in the field
- Consequences of not following safeguard norms on time
- Preparation of DDR and RP
- Process of land donation or negotiated land purchase
- Checklist for social safeguard and gender while visiting sites
- Gender – meaning, understanding and key concepts
- Considering gender in project designing and implementation
- Gender equality and equity
- Common perception regarding gender

Session 3: Environmental Safeguards and its applications

During the session in the respective subject matter, Environmental Safeguard Team– PDMC made an effort to make the participants understand that Environment Safeguards aims at minimizing environmental impacts while executing the project activities in the field. Process of doing the same was discussed through

implementation of Environmental Management Plan (EMP) proper awareness, and taking required mitigative measures. It was also shared with the participants that contractor has to continually comply with EMP strictly, proper solid waste/ waste water management, use of personal protective equipment's (PPE), continued supply of potable drinking water and First aid kits to workers/staffs and proper Health and Safety Plan (OHSP).

The report summarizes how ADB is structured and how it operates. ADB aims to improve environmental conditions of the rural and urban poor to enhance their chances for a better quality of life. We do this by working with governments and the private sector to fund land and water management systems; better resource management systems; cleaner energy production; expanded water supply, sanitation, and waste management services; and much more.

ADBs current strategies emphasizes infrastructure investments with new approaches to focus on sustainability of their economic development. The impact of poor environmental quality and degraded resources on individuals, families, and communities poses a threat to the poor and increases the strain on those living on the margins of poverty. Most of the poor live in rural areas where they are highly dependent on ecosystems for their needs. Yet unsustainable exploitation and conversion is severely straining the forests, coastal systems, and lands from which they make their livings. And the very poorest tend to depend on the most marginal of areas, often contributing to resource degradation just to survive. As rural ecosystems become degraded, they lose their life-supporting functions—which sustain not only rural communities but urban populations. All queries of the respective ULBs were satisfactorily resolved regarding environmental concerns.

Topics discussed under Environment Safeguards are:

- Safeguard Requirement (ADB's Safeguard Policy Statement 2009)
- Importance of Safeguards (Prevent and mitigate harm to people and environment)
- Environmental Safeguards Policy Principles and requirements-ADB
- Major Rules and regulations for compliance
- Environmental Safeguard-Schedule and time frame of activities
- Details of Environmental Management plan (EMP)
- Activities during pre-construction phase (Statutory clearance, consent, NOC, Utility Shifting, selection of location, stockpile areas, disposal areas, material etc.)
- Environment safeguard requirement before start of project implementation
- Environment safeguard requirement during project implementation
- Project Implementation Phase EMP-site Environment Compliance
- Environmental Safeguard -Reporting

Session 4: Institutional Setups in Urban Scenario and Municipal Administration

This Session was focused on the urban scenario related to ULBs. Tripura urban sector has been facing crucial challenges like all other northeastern Indian cities. Geographical location and limited connectivity with India's main land are some permanent challenges. But those challenges can convert as value addition by improvement of governance efficiency. Natural resources, historical and tourist attractions are investment values for the urban sector. Those can be optimally utilized by attracting new urban investments and building new urban infrastructure. A few issues and challenges are mentioned below.

- Urban investments and improvement in the Physical Infrastructure of Cities.
- Reform linked investment strategy.
- Creating a self-sustainable service delivery mechanism and augmenting resources.
- Implementation of urban reforms addressing the causes and problems of the cities in the implementation of the reforms and suggest measures.

In addition to it the key objectives of creating Tripura Municipal Services were also discussed during the said session. In context of the same, the present scenario of ULBs, its staffing, institutional setting at ULBs, urban governance and administrative framework and the way forward was also a part of session.

Opening session

The opening session is staring with greeting of the guest of honour: -

1) Dr. Tamal Majumdar, Director of Urban Development,
2) Mr. Mihir Kanti Gop , Cheif planner TUDA & Project Coordinator PMU, TUDA , ADB project ,
3) Dr. Anup Kumar Aditya, Team Leader, PDMC.

After that the Expert of PDMC and the participants of the ULBs to get to know each other. The introduction will cover the background, work related to infrastructure devel opment of the participants. In the of the workshop Dr. Tamal Majumder (Director of UDD) give his valuable inaugural speech related to ADB project followed Mr. Mihir Kanti Gop , Cheif planner TUDA & Project Coordinator PMU, TUDA , ADB project & Dr. Anup Kumar Aditya ,Team Leader , PDMC.

Orientation workshop session

Training/ Learning Objectives	**Session Mode**	**Duration**	**Resource Person**
Day One- 19.12.2022			
Registration for the Workshop cum training		30 Mins	
Welcome address to the participants and introductory session		30 Mins	Dr. Tamal Majumder (TCS), Director, UDD
Orientation on ADB Guidelines and Protocol	• Lecture • Discussion • Power Point presentation through Projector	60 Mins	Mr. M.K. Gop, Chief Planner, TUDA
Social Safeguards ➢ Orientation on the basic Safeguard Principles ➢ Project Categorizations ➢ Social Safeguard Reports and documentations ➢ Social Safeguard Requirements for project implementation ➢ Difference of DDR with RP/ IPP & SSMR ➢ Good practices of safeguard ➢ Consequence of bad safeguard practices	• Lecture • Discussion • Power Point presentation through Projector	120 Mins	Mr. Jayanta Chakraborty, Social Safeguard Expert, PDMC
➢ Uses & Importance of GRM & GRCs at various levels. ➢ Gender Equality & Social Inclusion	• Lecture • Discussion • Power Point presentation through Projector	60 Mins	Mr. Jayanta Chakraborty, Social Safeguard Expert, PDMC
Environmental Safeguards ➢ Orientation on the basic Safeguard Principles ➢ Project Categorizations ➢ Environmental Safeguard Reports and documentations	• Lecture • Discussion • Power Point presentation through Projector	120 Mins	Dr. Ardhendu Mitra, Environment Safeguard Expert, PDMC

➢ Environmental Safeguard Requirements for project implementation ➢ Different types of reports – IEE, SEMP & SEMR ➢ Good practices of safeguard ➢ Consequence of bad safeguard practices			
Feedback from participants		30 Mins.	All participants
Day Two- 20.12.2023			
Topic: ➢ **Municipal Administration and overview of urban scenario in Tripura** ➢ ULB governance/administration in Tripura and the role of urban staff in urban development and infrastructure ➢ Discussion follows with participants to share their existing scenario in respective ULBs. ➢ Discussion constitution/statutory obligations with reference to 74th CAA and Tripura Municipal Act, ➢ ULB as organisation, powers and functions of ULB and role of various functionaries ➢ Urban governance reforms – way forward	• Lecture • Discussion • Power Point presentation through Projector	2 Hours	Institutional Expert, PDMC
Finance: ➢ Modalities of project fund disbursement ➢ Project Accounting System	• Lecture • Discussion • Power Point presentation through Projector	2 Hours	Finance Expert, PDMC
➢ Procurement & its principles ➢ Various stages of procurement ➢ Types of procurement ➢ Procurement Methods ➢ Procurement Checklist ➢ Basics of contract management	• Lecture • Discussion • Power Point presentation through Projector	2 Hours	Procurement Expert, PDMC
Feedback from participants		15 Mins	All participants
Valedictory Session		5 Mins.	Official from TUDA

Closing session

After complete all the session by the experts of PDMC, Certificates are distribute to all them participants per procuration Mr. Mihir Kanti Gop , Chief planner TUDA & Project Coordinator PMU, TUDA , ADB project & Dr. Anup Kumar Aditya ,Team Leader , PDMC. And close up the workshop with vote of thanks by means of Mr. Mihir Kanti Gop , Chief planner TUDA & Project Coordinator PMU, TUDA , ADB project.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ORGANISED BY
(PDMC)
&
(TUDA)


ADB
ORIENTATION WORKSHOP ON SAFEGUARDS,
FINANCE, PROCUREMENT & INSTITUTIONAL
ARRANGEMENTS
ORGANISED BY

Annexure II

Attendance Sheet

ORIENTATION WORKSHOP ON SAFEGUARDS, FINANCE, PROCUREMENT & INSTITUTIONAL ARRANGEMENTS - 2022

PDMC (TUDA)
Venue - Geetanjali State Guest House.

DATE- 19.12.2022

Sl./No	Name	Designation & ULB Name	Sex (Male / Female)	Contact No.	Signature.
1	Ratish Ch. Debbarma	Jr. Er, Bishalgarh M.C.	M	8974093128	[signature]
2	Subhra Jyoti Dee	Acct BMC	M	9362122801	[signature]
3	Farrukh Hossain	C.O, BMC	M	7005693783	[signature]
4	Biswajit Bhattacharjee	Accountant, Ambassa MC	M	9485067001	[signature]
5	Er. Depankar Sharma	JE, Ambassa MC	M	7005353201	[signature]
6	Er. Amrita Debbarma	J.E, Chawmanu R.D Block	F	9774579116	[signature]
7	Somali Paul	LDC. Chasilam RD Block	F	9383133641	[signature]
8	Bishal Deb	Account Section	M	8787352526	[signature]
9	Er. Susmita Chakraborty	J.E, Mohanpur MC	M	9436484762	[signature]
10	Er. Abhijit Debnath	JE, Jirania NP	M	7005639026	[signature]
11	Biswajit Das.	Asstt. Manager (Finance), TUDA	M	7005248629	[signature]
12	Er. Prasenjith Das.	Junior Engineer, Amarpur NP	M	9436505127	[signature]

Sl./No	Name	Designation & ULB Name	Sex (Male / Female)	Contact No.	Signature.
13	Abhijit Dasgupta	Accounts Sec Amarpur N.P.	M	8014477123	[signature]
14	Er. Swapan Chakraborty	JE, Sabroom M C	M	7005278180	[signature]
15	Er. Shubhajit Paul	Technical Section, RMC	M	6009576328	[signature]
16	Er. Dulal Ch. Ghosh.	JE - Kamalpur NP.	M.	9436582423	[signature]
17	Parimal Chandra Nandi	Accountant Belonia MC	M	9862610248	[signature]
18	Er. Kamal Nag	J.E Belonia M.C.	M	7627966564	[signature] 19/12/2022
19	Gopendra Biswas	Accountant, Teliamura Municipal Council	M	9436488974	[signature] 19/12/2022
20	Er. Biju Bon D/Barma.	J/E, Teliamura Municipal.	M.	7005563306	[signature]
21	Er. Pritam Saha.	JE. Melaghar Municipal.	M.	9774119382	[signature]
22	Er. Pranjit Laxmi (M)	J.E Sonamura Nagar Panchayet	M	8837210671	[signature]
23	Ajoy Chakraborty	Cashier, Sabroom	M	9612472435	[signature]
24	Radheshyam Saha	Accounts Incharge SNP	(M)	9436517198	[signature] 19/12/22
25	Ruma Pal Deb	Acctt-in-Charge AMC	(F)	9485062654	[signature] 19-12-2022
26	Subrata Deb.	JE Kailashahar MC.	(M)	8415861186	[signature]
27	Binoy Bhushan Paul	JE, Kumarghat MC	M	8837233816	[signature]
28	Prafulla Kumar Deb	Cashier, Acctt i/c KGT MC	(M)	9402355912	[signature]
29	Raj Kumar Debbarma	L D C Lan Cachu	(M)	8787761715	[signature]
30	Amanesh Das	J.E(U.M.C)	(M)	8259093314	[signature]

Sl./No	Name	Designation & ULB Name	Sex (Male / Female)	Contact No.	Signature.
31	Tapan Sarkar	DRW UMC	Male	7629041426	
32	Saikat Roy	Asstt. Khowai MC	Male	9436514027	
33	Subhra Pachare	Asstt. DMC	male	9862122807	
34	Prasenjit Deb	office Assistant (TUDA)	Male	8837341214	
35	Mousumi Das.	JE, TUDA	Female	7005292934.	
36	Sujoy Chakraborty	SOCIAL Safeguard (Suffy)	Male	9862246728	
37	Rita Mandal.	Environment Safeguard (Expert)	Female	9051749939	
38	Pradeep Sangma	Social Safeguard	male	9707001669	
39	Jayanta chakraborty	Social Safeguard & Gender Expert	M	8761805667	
40	Atanu Chakraborty	Office Assistant, PDMC	M	8787832479	
41	Susmita Begam	Socio Economic (TUDA) PDMC Surveyor	F	8132049782	
*42	Rupak Debnath	CMM(TULM), Panisagar NP	M	8118937105	
*43	Prabanta Das.	SBM Expert Panisagar NP.	M	8131971297	

ORIENTATION WORKSHOP ON SAFEGUARDS, FINANCE, PROCUREMENT & INSTITUTIONAL ARRANGEMENTS - 2022

PDMC (TUDA)
Venue - Geetanjali State Guest House.

DATE- 20/12/2022

Sl./No	Name	Designation & ULB Name	Sex (Male / Female)	Contact No.	Signature.
1	Biswajit Bhattacharjee	Accountant, Ambassa MC	M.	9485067029	20.12.22
2	Rupak Debnath	CMM (TULM) Panisagar NP	M	8118937105	
3	Prabanta Das.	SBM Expert	M	8131971297	
4	Anjida P/Barma	J.E, charilam Block	F	9774577116	20/12/22
5	Somali Paul	LDC, charilam Block.	F	9383133641	20/12/22
6	Hridul Dey	SA, Sabroom Nagar Panchayat	M	9612004652	20/12
7	Bishal Deb	Account Section	M	8787352526	
8	Er. Subrata Chakraborty	J.E, Mohanpur MC	M	9436184762	
9	Er. Prasenjit Das.	J.E, Amarpur NP	M	9436505127	
10	Er. Swapan Chakraborty	J.E Ranirbazar N.C	M	7005278180	
11	Er. Shubhajit Paul	Technical Section, RMC	M	6009576328	
12	Er. Dulen Ch. Ghosh.	J.E. Kamalpur NP.	M.	9436582423	

Sl./No	Name	Designation & ULB Name	Sex (Male / Female)	Contact No.	Signature.
13	Parimal Chandra Nandi	Acctt. Belonia MC	M	9862610248	
14	Abhijit Dasgupta	Accounts Sec Amarpur M.P.	M	8014497123	
15	Bijoy Jiban Barma	J/E	M	~~7005583306~~	
16	~~Gopendra~~ Biswas	~~Accountant~~/Teliamura M.C	M	8837068546	
17	Abhijit Debnath	Junior Engineer, JNP	M	7005639006	
18	Surajit Das.	Asstt. Manager (Finance)	M	7005243629	
19	Farrukh Hossain	C/O, Bishalgarh MC	M	7005693783	
20	Subhra Jyoti De	Acct. DMC	M	9862122801	
21	Tapan Sarkar	Acct. UMC	M	7629041426	
22	Ajoy Chakraborty	Cashier SMC	M	9612472425	
23	Rajkumar Debbarma	Melaghar MC Cashier	(M)	8787761215	
24	Amaresh Rao	J.E, UMC	(M)	8259093314	
25	Subrata Deb	JE, Kailashahar MC.	(M)	8415861186	
26	Binoy Bhushan Paul	JE, Kumarghat MC	(M)	8837233816	
27	Prafulla Kumar Deb	Cashier, I/C Accts sec KGT MC	(M)	9402355912	
28	Ruma Pal Deb	Acct-in-charge /Acctt. sec.	(F)	9485062654	
29	Radheshyam Saha	Acctt. in-charge	(M)	9436517198	20/12/22
30	Pranjit Paul	J.E Sonamura Nagar Panchayet	(M)	8837210671	
40	Jayanta Chakraborty	Social Safeguard & Gender Expert	M	8761805667	
41	Atanu Chakraborty	Office Assistant, PDMC	M	8787832479	
42	Dr. K. Sriram	Urban Governance Expert, TUDA	M	9440136718	
43	Bidhan Biswas	FM Expert, PDMC, TUDA	M	9830154226	
44	Pavan Pareek	FME TUDA TTDCL	M	9314660221	
45	Susmita Begam	Socio Economic Survey Exp PDMC	F	8132049733	
46	Er. Dipankar Sharma	J.E, Ambassa	M	7005353201	
47	Er. Karan Nag	J.E Belonia	M	7002966564	
(48)	Er Rajib Deb Barma	JE Khowai	M	8416048223	

Appendix 9: Sample Grievance Registration Form

SAMPLE GRIEVANCE REGISTRATION FORM

(To be available in Bengali and English)

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

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

FOR OFFICIAL USE ONLY

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

অভিযোগ নিবন্ধন ফর্মের নমুনা

..... প্রকল্পকে বাস্তবায়িত করার লক্ষে অভিযোগ, পরামর্শ, অনুসন্ধান এবং মন্তব্যের জন্য স্বাগত।

আমরা অভিযোগকারীকে অভিযোগ সহ নাম জানাতে উৎসাহিত করি এবং আপনার সাহচর্যে এসে এর শোধন ও প্রতিক্রিয়া জানাতে সক্ষম হই।

অবশ্যই আপনি আপনার ব্যক্তিগত বিষয় বিস্তারিত ভাবে যুক্ত করতে ইচ্ছাপ্রকাশ করবেন। যে তথ্য আপনি দেবেন, তা অবশ্যই গোপন থাকবে। তাই অনুগ্রহ করে আপনার নাম লিখে / টাইপ করে জানান।

তারিখ	নিবন্ধনের জায়গা	প্রকল্পের শহর প্রকল্পঃ			
যোগাযোগের তথ্য / বিস্তারিত ব্যক্তিগত তথ্য					
নাম		লিঙ্গ	পুরুষ মহিলা	বয়স	
বাড়ীর ঠিকানা					
জায়গা / স্থান					
ফোন নঃ					
ই-মেল					
যেকোন অভিযোগ / পরামর্শ / মন্তব্য / প্রশ্ন অনুগ্রহ করে নিচে বিস্তারিতভাবে (কে, কি, কোথায় এবং কেমন করে) আপনার অভিযোগ জানান যদি কোন সংযুক্তি / চিরকুট / চিঠি অন্তর্ভুক্ত করতে চান, অনুগ্রহ করে সেখানে টিক দিন।					
আপনার অভিযোগ / মন্তব্যের হালনাগাদ (আপডেট) বা প্রতিক্রিয়া কিভাবে পেতে চান?					

Office ব্যবহারের জন্যঃ

অভিযোগ নিবন্ধনকারী আধিকারিকের নামঃ	
যোগাযোগ ব্যবস্থাঃ চিরকুট / চিঠি- ই-মেল- মৌখিক / টেলিফোন-	
নিবন্ধকৃত অভিযোগ পর্যালোচনাকারী আধিকারিকের নাম ও পদঃ	
অভিযোগের বিরুদ্ধে গৃহীত ব্যবস্থা-	
গৃহীত ব্যবস্থা প্রকাশ্যে আনা হয়েছে কি না	হ্যা না
প্রকাশের উপায়	

Appendix 10: GUIDELINES FOR WORKERS CAMPS

(Based on IFC benchmark standards for workers accommodation)

Guidelines for Workers' Accommodation

1. Availability of sufficient number of clean rooms for the workers with adequate facilities of ventilation, Drinking water, Electricity/fan/light (natural and artificial lighting) etc. in each room.
2. Camps should not be subjected to periodic flooding nor located within 200 feet of swamps, pools, sink holes or other surface collections of water. All sites should be graded, ditches and rendered free from depressions in which water may become a nuisance.
3. Accessibility to an adequate and convenient supply of potable water to the workers. Depending upon the climate, weather conditions and accommodation standards, 80 to 180 litres per persons per day water should be available and drinking water should meet the national/WHO drinking water standards.
4. Camp site should be adequately drained to avoid the accumulation of stagnant water.
5. All tanks used for the storage of drinking water should be constructed and covered as to prevent water stored therein from becoming polluted or contaminated.
6. All sites should be adequate in size to prevent overcrowding of necessary structures.
7. Camps should have Crèche facility for children with necessary arrangements.
8. The grounds and open areas surrounding the shelters should be maintained in a clean and sanitary condition free from rubbish, debris, waste papers, garbage or other refuse.
9. Beds, cots, or bunks, and suitable storage facilities such as wall lockers for clothing and personal articles should be provided in every room used for sleeping purposes.
10. A separate bed for each worker should be provided. Double deck bunks are not advisable for the safety and hygiene reasons and their use should be minimized. If they are used there must be enough clear space between the lower and upper bunk of the bed. Standard range is 0.7 to 1.10 meters. Triple deck bunks are prohibited.
11. All heating, cooking, and water heating equipment should be installed in accordance with State and local ordinances, codes, and regulations governing such installations. If a camp is used during cold weather, adequate heating equipment should be provided.
12. If food is provided, it should cater for different cultural needs. Kitchens should be provided with facilities to maintain adequate personal hygiene including a sufficient number of washbasins designated for cleaning hands with clean running water and materials for hygiene drying.
13. All kitchen floors, ceiling and wall surface adjacent to or above food preparation and cooking areas should be built using durable, non-absorbent, easily cleanable, non-toxic materials.
14. No person with any communicable disease shall be employed or permitted to work in the preparation, cooking, serving, or other handling of food, foodstuffs, or materials used therein, in any kitchen or dining room operated in connection with a camp or regularly used by persons living in a camp.
15. There should be recreation facilities for the camp workers i.e. TV/sports/newspaper/magazine etc.
16. There should be facility of mosquito's prevention and control i.e. use of mosquito

net/coil/electric repellent/pesticide etc.

17. Sanitary and toilet facilities should be constructed of the materials that are easily cleanable. Standard range of the toilets varies from 1 unit for 6 persons to 15 persons. For urinals, standards are 1 unit for 15 persons.
18. There is no need to provide separate urinals in any place where less than 50 workers are employed or where the latrines are connected to water borne sewage system.
19. Sanitary and toilet facilities should be designed to provide workers with adequate privacy including ceiling to floor partitions and lockable doors.
20. Separate toilet and bathing facilities should be available for Men and women. These facilities shall be distinctly marked "for men" and "for women" by signs printed in English and in the native language of the persons using the facilities, and/or marked with easily understood pictures or symbols.
21. Workers' gender, religious, cultural and social backgrounds should be respected. In particular, workers should be provided with the possibility of celebrating religious holidays and observances.
22. No pets, birds or livestock should be kept or fed unless approved by management or camp operator.
23. There should be proper arrangement of colour coded dustbins i.e. Green for wet/biodegradable wastes, blue for dry/non-biodegradable waste and red for safe disposal of domestic hazardous waste i.e. sanitary napkins and diapers.
24. There should be adequate facility for waste water management (i.e. septic tanks/soak pits) and for disposal of Municipal solid waste (i.e. composting).
25. The person in charge of managing the accommodations has a specific duty to report to the health authorities the outbreak of any contagious diseases, food poisoning and any other important casualties.
26. Guidance on the detrimental effects of the abuse of alcohol and drugs and other potentially harmful substances and the risk, concerns related to HIV/AIDS and other health risk related activities should be provided to the workers through group/individual orientations and should also be displayed at camps as visual boards.
27. Workers should have easy access to medical facilities and medical staff where possible female doctors/nurses should be available for female workers. Regular health check up should be done for the workers. First-AID Kit/Health care facilities should be available in the camps. There should be proper demarcation/display of First Aid facility and First Aider.
28. A specific fire safety plan should be prepared including training of fire wardens, periodic testing and monitoring of fire safety equipment.

    All key contacts, emergency contact number, including nearby hospital should be posted in a prominent place and in all languages present e.g. at camp gate and throughout the camp.

Appendix 11: Guidelines for Prevention and Control of COVID-19

Introduction:

Construction worksite and other workplaces are relatively close settings, with shared spaces like work area,pathways, Worker camp, Site office and material handling area etc. and COVID-19 infection can spread relatively fast among workers, staffs and visitors.

There is a need to prevent spread of infection and to respond in a timely and effective manner in case suspect case of COVID-19 is detected in these settings, so as to limit the spread of infection.

Principles of Worker Protection:

- Consistently practice social distancing.
- Cover coughs and sneezes.
- Maintain hand hygiene.
- Clean surfaces frequently.

Maximum Precaution for Persons/Labourers Reporting To Work:

- IF SICK, STAY HOME!
- IF SICK, GO HOME!
- IF SOMEONE SICK, SEND THEM HOME!

Covid-19 Typical Symptoms:

- Fever
- Cough
- Shortness of Breath
- Sore Throat

Morning and evening temperature screening of all persons at the worksite is done by EHS officer with Infrared Thermometer and register was also maintained.

Self-Attestation By Persons/Labour Prior To Work:

Prior to starting a work, each labour /worker will self-attest to the supervisor and the documents is collected by EHS Officer. It consists the following points,

- No signs of COVID-19 symptoms within the past 24 hours.
- No contact with an individual diagnosed with COVID-19. (contact means living with a positive person, being within 6 ft. of positive person OR sharing things of positive person).
- Not undergone quarantine or isolation (in case of any labourer /worker who has been quarantined or isolated previously, the engagement shall be only after obtaining the requisite clearance from trained and registered medical practitioner).

The self-attestation would be verified by EHS officer deployed at site through discussions with laborers /workers and/or preliminary checks such as temperature checks, etc. prior to their engagement at site.

Persons/Labourers showing COVID-19 symptoms or not providing self-attestation will be directed to leave the work site and report to the fever clinic/quarantine Centre immediately. Labour not to return to the work site until cleared by fever clinic/quarantine Centre.

General Guidelines:

- No hand shake is permissible at site, office.
- Non-essential physical work that requires close contact between workers will not be carried out.
- Hand sanitizer is used before entry of the site.
- No unauthorized person will enter the work site other than mentionedby supervisor during start of work.
- All individual work group meetings/ talks will follow social distancing.
- Worksite had COVID-19 safety guidelines.
- All restroom /toilet facilities will be properly cleaned, and hand washing facilities provided with soap, hand sanitizer.
- Water bottle present at site will not be shared.
- Social Distancing will be maintained during breaks and lunch.
- Coughing or sneezing must cover with a personal handkerchief and then wash hands. Coughing or sneezing in hands was avoided.
- Avoid touching eyes, nose, and mouth with hands.
- If family member is feeling ill, stay home.
- Separate disposal bins were placed for collection of used masks/used hand tissues, etc.
- Spitting will be strictly prohibited.

Work-Site Prevention Practices:

- At the start of each day, confirmation will be taken from all employees that they are healthy and all workers will be informed about reusable and disposable PPE.
- Outside person(s) will be strictly prohibited at worksite.
- Use of eye protection (reusable safety goggles/face shields) is recommended.
- In work conditions where required **social distancing is impossible** to achieve, such employees will be supplied with appropriate PPE's.
- All employees will drive to work site in a single occupant vehicle.
- Workers will maintain separation of 6 feet from each other wherever possible.
- High contact surfaces will be properly disinfected in order to minimize the spread of germs in the areas that people touch frequently.
- The contactless temperature checks was done for the workers prior to site entrance and after site works to identify persons showing signs of being unwell with the COVID-19 symptoms.

Washing Facility:

- Worksites already have access to toilet and hand washing facility.
- At entrances and exits hand cleaning facilities is provided.
- All onsite workers help to maintain and keep work area clean.

Labour Camp

- follows a zero-tolerance policy on wearing of masks.
  - Masks provided to all the persons/labourers for use at the camp site as well as at the worksite.

  Toilet Facility
  - The number of people using Toilet facility will be limited at any one time.
  - Hands washing must be done before and after using the facilities.

Eating/snacks Arrangements

- Dedicated eating areas is marked on camp and workers also instructed to reduce food waste and contamination.
- Hand cleaning facilities or hand sanitizer is available at the entrance of worker dining room.
- Workers seated at a distance of 2 meters apart from each other while eating.
- Drinking water provided with proper cleaning measures and consists of tap mechanism.
- All areas used for eating is thoroughly cleaned at the end of each break and shift.

EHS Officer will ensure compliances with prevention issues at the labour camp.

Training

- All workers get training by EHS officer on above requirements before start of any construction activities.
- During construction period frequent visual and verbal reminders will be given to workers forimproving compliance with hand hygiene practices and thus reduce rates of infection.

Emergency Contact

- Emergency contact number(s) at work site and labour camp for reporting COVID-19 symptoms is provided.

COVID-19 Safety Coordinator(s)		
Name	**Title/Facility Location**	**Contact Information (office location, phone, email address)**

Sequence of operation performed regarding COVID-19 safety performed at site:-

- Before entering the worksite for the first time the workers must fill and sign the self-declaration form and also submit the vaccination certificate.
- Before starting each day work the workers body temperature is monitored. If workers body temperature was found higher, then he was not allowed to work at site and he will be consult with doctor as per guidelines.
- Along with body temperature measurement workers hand also sanitized with hand sanitizer.
- With face mask workers, supervisors & officials were only allowed at worksite.
- If any situation suffocation problem is arise then the worker is instructed to maintain proper distance from others and work individually.
- During the work wherever possible social distance was maintained. But during construction activities where social distancing is not possible to maintain, there proper PPE's was used.
- During lunch or tiffin time the worker was instructed to clean his hand with hand wash and water.
- Worker camp areas and work location were disinfected time to time.
- Before leaving the worksite the workers body temperatures was again measured and noted on the register.

Appendix 12: Water Allocation Permission

Government of Tripura
Office of the Executive Engineer
Water Resource Investigation Division
Visveswaraya Complex,
Kunjaban: Agartala

File No. 1(40) /EE/WRID/TECH/2021/3007-09 Dated: 08-02-2023

To
The Chief Planner
Tripura Urban Planning & Development Authority (TUDA)
2nd floor, U.D. Bhawan, Shakuntala Road,
Near Rabindra Satabarshiki Bhawan, Agartala, 799001.

Subject:- Regarding water allocation for water supply projects under ADB loan under TUDA, UD Deptt.

Reference:-1. Letter no. F.03(09)- TUDA/Project/ 2021 /P-1/ 6207-10 dated: 20/01/2023
2. TO Letter no. F.1(40)/EE/WRID/TECH/2020/454-56 dated:- 11/05/2022

Sir,

Kindly refer to above on the subject at issue. In this connection, I am directed to inform you that the withdrawal of surface water from the river Gumati, Juri & Manu for construction of water treatment plant in the town of Kailashahar, Kumarghat, Dharmanagar & Udaipur at the following rate is allowed for drinking water purposes. Therefore, it is requested to go ahead for construction of Treatment plant. This is in partial modification of this office letter no. 1(40) /EE/WRID/TECH/2021/2896-98 Dated: 24-01-2023.

Sl. No.	Name of River	Quantity of withdrawal of Surface water(per month)	Remarks
1.	Gumati	0.573 MCM	
2.	Juri	0.603 MCM	
3.	Manu	0.429 MCM	

Yours faithfully,
8/2/23
(Er. B. SAHA)
Executive Engineer
Water Resource Investigation Division
Kunjaban : Agartala

Copy to:-

1. The Chief Engineer, PWD(WR), Visvesaraya Complex, Kunjaban, Agartala, (W) Tripura for favour of his kind information please. This has a ref. to his discussion over phone on 6th and 8th February, 2023.
2. The Additional Chief Engineer, P& D Unit, PWD(WR), Kunjaban, Agartala for favour of his kind information please.

Executive Engineer
Water Resource Investigation Division
Kunjaban : Agartala.

MONTH WISE YIELD DISTRIBUTION AT SONAMURA BASED ON RAIN FALL DATA FROM 2009 TO 2018 OF GOMOTI RIVER, CATCHMENT AREA= 2492.00 Sqkm

MONTH (1)	% OF ANNUAL RF (2)	RUNOFF MCM (3)	Water requirment for surface water schemes under PWD (WR)(IN MCM) (4)	Water requirment for surface water schemes under PWD (DWS) (IN MCM) (5)	Water requirement for Udaipur Town under ADB projct as proposed by Authority (Design year 2053) (6)	Total surface water requirment (WR+DWS+ADB) in MCM for operating the existing / Proposed schemes (7)	Balance water in MCM (8)	Remarks (9)
june	16.88	414.33	222.3	0.7695	0.573	223.6425	190.6875	Surplus
july	14.88	365.15	222.3	0.7695	0.573	223.6425	141.5075	Surplus
Aug	17.06	418.67	222.3	0.7695	0.573	223.6425	195.0275	Surplus
Sept	14.25	350.15	222.3	0.7695	0.573	223.6425	126.5075	Surplus
Oct	7.65	187.69	222.3	0.7695	0.573	223.6425	-35.9525	Deficit
Nov	1.2	29.36	222.3	0.7695	0.573	223.6425	-194.2825	Deficit
Dec	0.43	10.52	222.3	0.7695	0.573	223.6425	-213.1225	Deficit
Jan	0.06	1.55	222.3	0.7695	0.573	223.6425	-222.0925	Deficit
Feb	0.34	8.26	222.3	0.7695	0.573	223.6425	-215.3825	Deficit
March	2.45	60.22	222.3	0.7695	0.573	223.6425	-163.4225	Deficit
April	7.3	179.13	222.3	0.7695	0.573	223.6425	-44.5125	Deficit
May	17.5	429.67	222.3	0.7695	0.573	223.6425	206.0275	Surplus
Total	82.5	2025.03	2445.3	8.4645	6.876	2453.7645		

Ground water extraction permission

F.1(40)/EE/ WRID/TECH/2020/.....58-60
Government of Tripura
Office of the Executive Engineer
Water Resource Investigation Division
Kunjaban:Agartala

TUDA RECEIVED Date 11/04 GOVT. OF TRIPURA

Dated 8th April ,2022

To
The Chief Planner,
Tripura Urban Planning & Development Authority
(Project Coordinator, PMU,ADB Project)
Agartala-799001.

Sub: - Loan 6037 IND : Tripura Urban & Tourism Development Project (TUTDP): Regarding Water allocation permission and sustainability of water supply source permission for 20 towns in Tripura State.
Ref: - Letter No. F.03(09-TUDA/ Project/2021/P-I/2995-97 dtd. 25/03/2022 of Tripura Urban Planning and Development Authurity (TUDA).

Sir,

1. Kindly refer to the above on the subject at issue. In this connection , I am directed to inform you that according to dynamic ground water resources estimation report of 2020, the Groud Water availability for future uses for 16 towns as stated in the under referrence's letter is in safer side. So, there is no bar for extraction of Ground Water.

2. The proposed water supply scheme based on surface water resources from river Juri, Manu and Gumati through intake well for Dharmanagar, kailashahar, Kumarghat and Udaipur is insignificant in lean period. A calculation sheet of runoff of the each river along with monthwise percentage of rainfall is enclosed herewith which may kindly be seen.

3. Regarding Water resource data like HFL, LWL, Discharge of 3 rivers as stated above and rainfall data from 2009-2018 of different sub-Divisions are enclosed herewith.

4. The Deep Tube Well yield map of Tripura is enclosed herewith.

Enclo: As Stated Above(34 no pages).

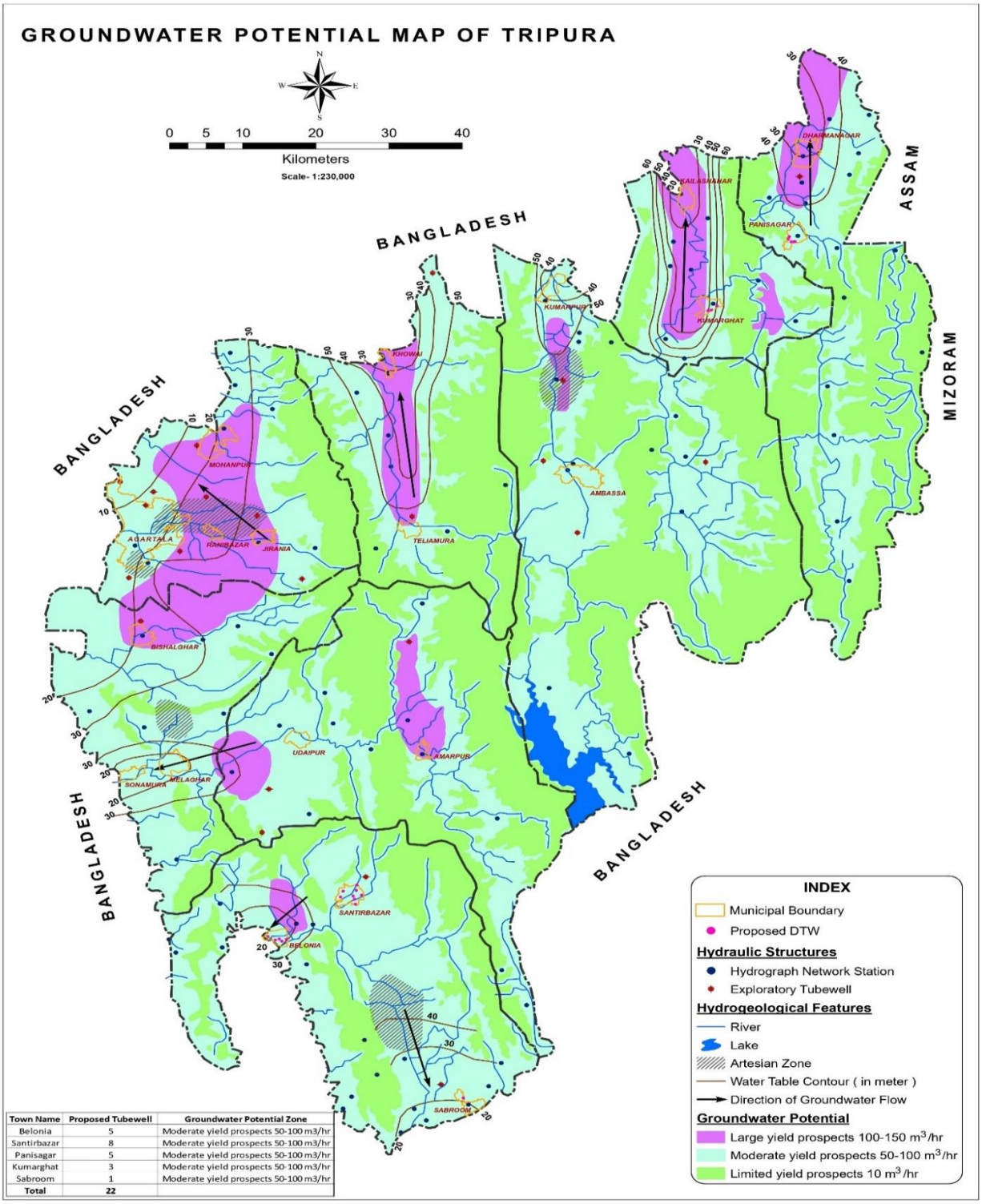
Yours faithfully,

(Er. B.SAHA) 8/4/22
Executive Engineer
Water Resource Investigation Division
Kunjaban , Agartala

① TL, PDMC
② TR-I
for info pl. 11/4/22

Copy to :-
1. The Chief Engineer, PWD, WR, Tripura, Visvesaraya Complex, Kunjaban, Agartala, Tripura(W) for favour of his kind information please.
2. The Superintending Engineer, O/O the Additional Chief Engineer, P&DUnit, PWD(WR) Visvesaraya Complex, Kunjaban, Agartala, Tripura(W) for favour of his kind information please.

Executive Engineer
Water Resource Investigation Division
Kunjaban , Agartala



Town Name	Proposed Tubewell	Groundwater Potential Zone
Belonia	5	Moderate yield prospects 50-100 m3/hr
Santirbazar	8	Moderate yield prospects 50-100 m3/hr
Panisagar	5	Moderate yield prospects 50-100 m3/hr
Kumarghat	3	Moderate yield prospects 50-100 m3/hr
Sabroom	1	Moderate yield prospects 50-100 m3/hr
Total	**22**	

Appendix 13: IBAT Assessment Checklists of Project Towns

IBAT

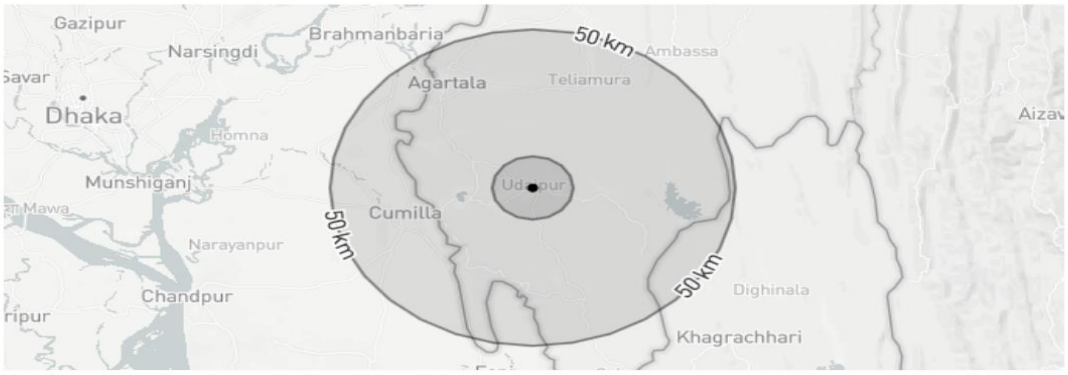
Integrated Biodiversity Assessment Tool

PROXIMITY REPORT
UDAIPUR, TRIPURA

Country: India
Location: [23.5, 91.5]
Date of analysis: 14 March 2023 (GMT)
Buffers applied: 10 km | 50 km
IUCN Red List Biomes: Marine, Freshwater, Terrestrial
Generated by: Govind Rathore
Organisation: ADB

Overlaps with:

Protected Areas	3
Key Biodiversity Areas	4
IUCN Red List	71



Displaying project location and buffers: 10 km, 50 km

Protected Areas

The following protected areas are found within 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Within buffer of
Pablakhali	50 km
Rajeshpur Eco-Park	50 km
Rudrasagar Lake	50 km

Key Biodiversity Areas

The following key biodiversity areas are found within 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance
Gumti Wildlife Sanctuary	50 km
Rudrasagar Lake	50 km
Sepahijala	50 km
Trishna Wildlife Sanctuary	50 km

IUCN Red List of Threatened Species

The following threatened species are potentially found within 50km of the area of interest.

For the full IUCN Red List please refer to the associated csv in the report folder.

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome

IBAT

Integrated Biodiversity Assessment Tool

PROXIMITY REPORT
AMARPUR, TRIPURA

Country: India

Location: [23.5, 91.7]

Date of analysis: 14 March 2023 (GMT)

Buffers applied: 10 km | 50 km

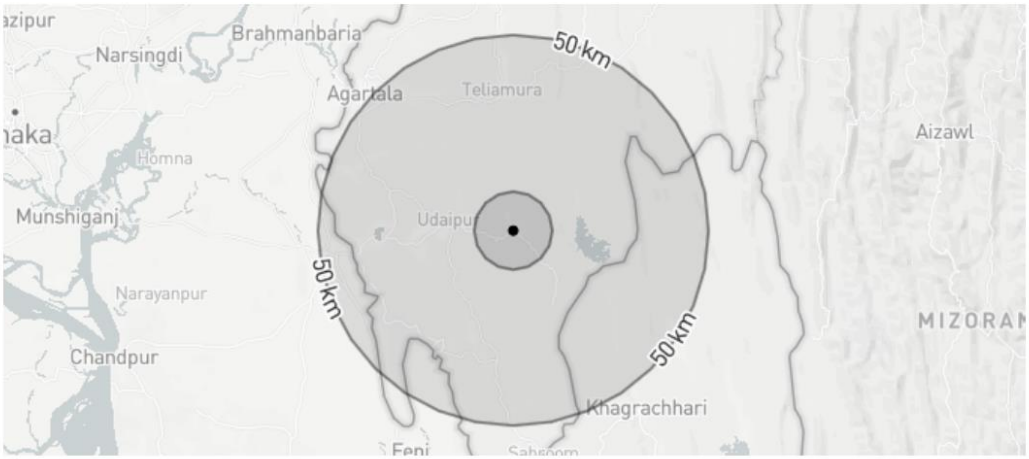
IUCN Red List Biomes: Marine, Freshwater, Terrestrial

Generated by: Govind Rathore

Organisation: ADB

Overlaps with:

Protected Areas	3
Key Biodiversity Areas	4
IUCN Red List	69



Displaying project location and buffers: 10 km, 50 km

Protected Areas

The following protected areas are found within 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Within buffer of
Pablakhali	50 km
Rajeshpur Eco-Park	50 km
Rudrasagar Lake	50 km

Key Biodiversity Areas

The following key biodiversity areas are found within 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance
Gumti Wildlife Sanctuary	50 km
Rudrasagar Lake	50 km
Sepahijala	50 km
Trishna Wildlife Sanctuary	50 km

IUCN Red List of Threatened Species

The following threatened species are potentially found within 50km of the area of interest.

For the full IUCN Red List please refer to the associated csv in the report folder.

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome

IBAT

Integrated Biodiversity Assessment Tool

PROXIMITY REPORT
BISHRAMGANJ, TRIPURA

Country: India

Location: [23.6, 91.3]

Date of analysis: 14 March 2023 (GMT)

Buffers applied: 10 km | 50 km

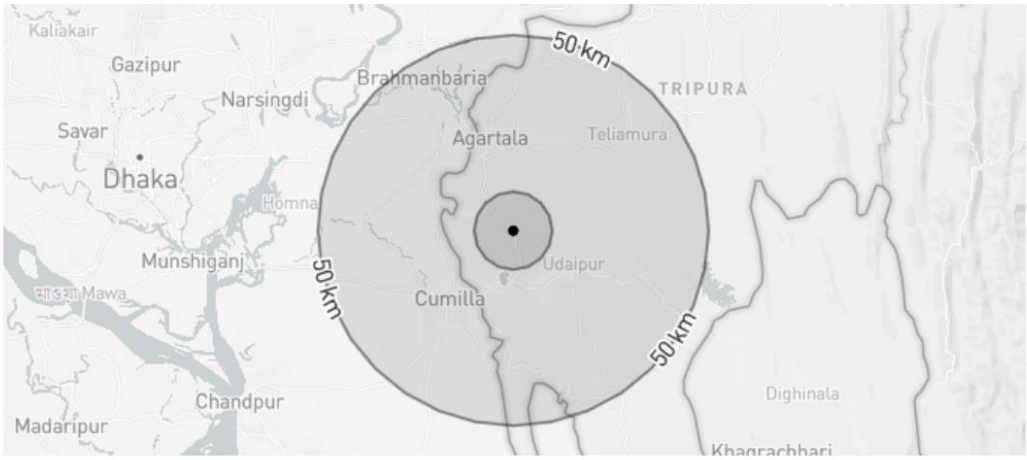
IUCN Red List Biomes: Marine, Freshwater, Terrestrial

Generated by: Govind Rathore

Organisation: ADB

Overlaps with:

Protected Areas	2
Key Biodiversity Areas	4
IUCN Red List	69



Displaying project location and buffers: 10 km, 50 km

Protected Areas

The following protected areas are found within 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Within buffer of
Rajeshpur Eco-Park	50 km
Rudrasagar Lake	50 km

Key Biodiversity Areas

The following key biodiversity areas are found within 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance
Sepahijala	10 km
Gumti Wildlife Sanctuary	50 km
Rudrasagar Lake	50 km
Trishna Wildlife Sanctuary	50 km

IUCN Red List of Threatened Species

The following threatened species are potentially found within 50km of the area of interest.

For the full IUCN Red List please refer to the associated csv in the report folder.

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Nilssonia nigricans	Black Softshell Turtle	REPTILIA	CR	Decreasing	Terrestrial, Freshwater

IBAT

Integrated Biodiversity Assessment Tool

PROXIMITY REPORT
MELAGHAR, TRIPURA

Country: India

Location: [23.5, 91.3]

Date of analysis: 14 March 2023 (GMT)

Buffers applied: 10 km | 50 km

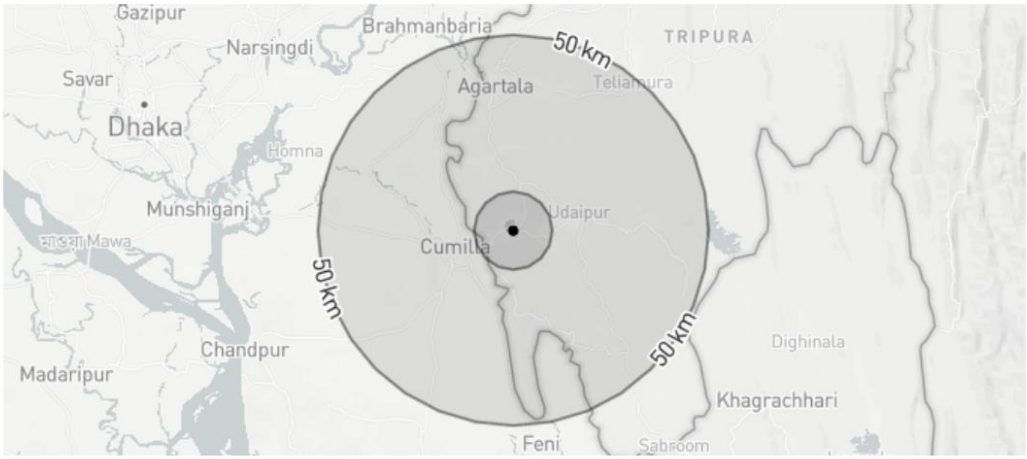
IUCN Red List Biomes: Marine, Freshwater, Terrestrial

Generated by: Govind Rathore

Organisation: ADB

Overlaps with:

Protected Areas	2
Key Biodiversity Areas	4
IUCN Red List	68



Displaying project location and buffers: 10 km, 50 km

Protected Areas

The following protected areas are found within 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Within buffer of
Rudrasagar Lake	10 km
Rajeshpur Eco-Park	50 km

Key Biodiversity Areas

The following key biodiversity areas are found within 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance
Rudrasagar Lake	10 km
Trishna Wildlife Sanctuary	10 km
Gumti Wildlife Sanctuary	50 km
Sepahijala	50 km

IUCN Red List of Threatened Species

The following threatened species are potentially found within 50km of the area of interest.

For the full IUCN Red List please refer to the associated csv in the report folder.

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Nilssonia nigricans	Black Softshell Turtle	REPTILIA	CR	Decreasing	Terrestrial, Freshwater

IBAT

Integrated Biodiversity Assessment Tool

PROXIMITY REPORT
BELONIA, TRIPURA

Country: India

Location: [23.2, 91.5]

Date of analysis: 14 March 2023 (GMT)

Buffers applied: 10 km | 50 km

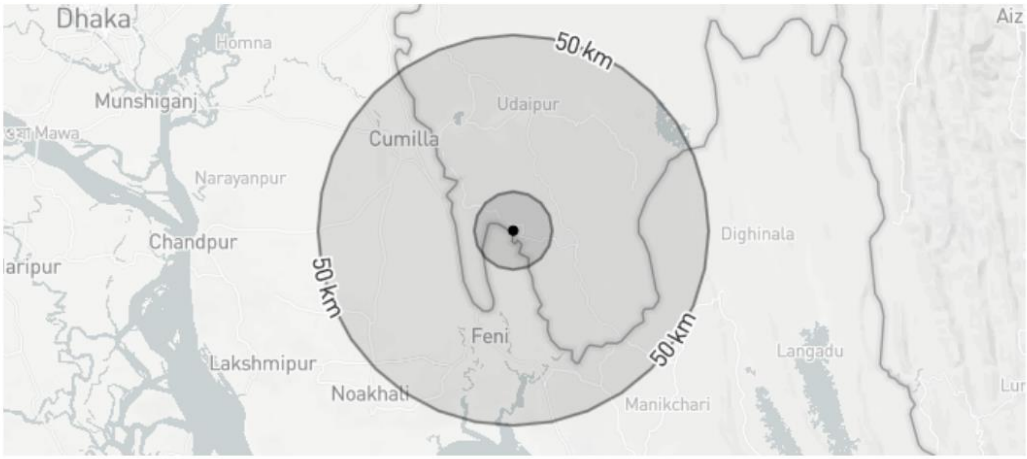
IUCN Red List Biomes: Marine, Freshwater, Terrestrial

Generated by: Govind Rathore

Organisation: ADB

Overlaps with:

Protected Areas	2
Key Biodiversity Areas	5
IUCN Red List	141



Displaying project location and buffers: 10 km, 50 km

Protected Areas

The following protected areas are found within 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Within buffer of
Rajeshpur Eco-Park	50 km
Rudrasagar Lake	50 km

Key Biodiversity Areas

The following key biodiversity areas are found within 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance
Trishna Wildlife Sanctuary	10 km
Gumti Wildlife Sanctuary	50 km
Muhuri Dam	50 km
Rudrasagar Lake	50 km
Sepahijala	50 km

IUCN Red List of Threatened Species

The following threatened species are potentially found within 50km of the area of interest.

For the full IUCN Red List please refer to the associated csv in the report folder.

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome

Appendix 14: Sample Environmental Site Inspection Report

Project Name Contract Number

NAME:_____DATE:_TITLE:_DMA: LOCATION:___GROUP:

WEATHER:	**Project Activity Stage**	**Survey**	
		Design	
		Implementation	
		Pre-Commissioning	
		Guarantee Period	

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

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

Signature

_____

_____

_____

Name Name

Position Position