Initial Environmental Examination

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India: Rajasthan Secondary Towns Development Sector Project – Additional Financing (PART A)

Ratangarh Storm Water Drainage

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

CURRENCY EQUIVALENTS

(as of 31 July 2022)

Currency unit – Indian rupee (₹)
₹1.00 = $ 0.01
$1.00 = ₹ 79.19

ABBREVIATIONS

ADB	–	Asian Development Bank
BOCW	–	Building and other Construction Workers
CLC	–	City Level Committee
CPCB	–	Central Pollution Control Board
DPR	–	Detailed Project Report
EHS	–	Environmental Health and Safety
EIA	–	Environmental Impact Assessment
EMP	–	Environmental Management Plan
IEE	–	Initial Environmental Examination
IFC	–	International Finance Corporation
MOEFCC	–	Ministry of Environment, Forest and Climate Change
PHED	–	Public Health Engineering Department
PIU	–	Project Implementation Unit
PMU	–	Project Management Unit
PWD	–	Public Works Department
REA	–	Rapid Environmental Assessment
ROW	–	Right-Of-Way
RSPCB	–	Rajasthan State Pollution Control Board
RSTDSP	–	Rajasthan Secondary Towns Development Sector Project
RUDSICO-EAP	–	Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation Limited-Externally Aided Projects
RUDSICO	–	Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation
ULB	–	Urban Local Body
WHO	–	World Health Organization
SWPS	–	Storm Water Pumping Station

WEIGHTS AND MEASURES

m^3	–	cubic meter
dB	–	decibels
^oC	–	degree centigrade
dia	–	diameter
kg	–	kilogram
kl	–	kiloliter
km	–	kilometer
kmph	–	kilometer per hour
KLD	–	kiloliters per day
ha	–	hectare
HP	–	horsepower
LPCD	–	liters per capita per day
lps	–	liters per second
m	–	meter
mg	–	milligram
mm	–	millimeter
MCM	–	million cubic meter
MLD	–	million liters per day
km^2	–	square kilometer

NOTE

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

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APPENDICES

Appendix C1 – C26 – common appendices, attached separately, provide statutory standards, guidelines, reporting templates etc. are applicable to all subproject IEEs.

List of common Appendices

EXECUTIVE SUMMARY

ADB approved a loan for the Rajasthan Secondary Towns Development Sector Project (RSTDSP, Loan 3972: IND) in September 2020. This is currently under implementation and will close by May 2028. The additional financing (the project) will expand the improved access to WSS services in at least ten urban local bodies (ULBs), benefiting 1.2 million people. Important value addition of the proposed project to the ongoing project is that it will provide innovative solutions to address climate change to respond to the growing climate risks and vulnerability and also to improve livability and prosperity through enhancing natural and/or built heritage at least ten ULBs in Rajasthan, benefiting 1.0 million people. The overall project is aligned with the following impacts: (i) access to potable, affordable, reliable, equitable, environmentally sustainable drinking water supply in all urban areas of Rajasthan improved, (ii) health status of urban population, especially the poor and under-privileged improved, and (iii) productivity, livability and prosperity for the citizens in Rajasthan cities and towns enhanced. Reflecting the additional measures to enhance climate resilience and heritage-sensitive urban development of the project, impact statement (iii) was added; the outcome statement is modified as quality, reliability, equity, and sustainability of urban assets and services in project towns of Rajasthan improved; and additional output was also added, resulting in four outputs.

Ratangarh is one of the project towns, and improvement of drainage system in Ratangarh is proposed under the RSTDSP-AF. Following are the proposed components under drainage system improvement:

Storm Water Drainage. Storm Water Pumping Station (SWPS). Total six (6) storm water pumping stations (SWPS): (a) SWPS-1 of 1.1 million litre per day (mld) near Railway Quarter, (b) SWPS-2 of 2.3 MLD at Saraf sump well, (c) SWPS-3 of 4.6 MLD at Parmana Taal, (d) SWPS-4 of 10 MLD at Main Ginani,[1] (e) SWPS-5 of 10 MLD near BSNL office, (f) SWPS-6 of 1.1 MLD near Hanuman Park; **Rising Main**: The rising mains comprise providing and laying DI K-9 pipe for disposal of storm water. Total 10.127 km long of diameter 150-400 mm new rising main is proposed; **Gravity Drain**: 960 meter of diameter 600mm to channelize flow to SWPS inlet at Main Ginani and near Hanuman Park SWPS; **Raw Water Reservoir (RWR)**: Three (3) nos. of raw water reservoirs (30 ML capacity each) at disposal points are proposed for utilization of storm water, (i) towards south of national highway-11 owned by Nagar Palika; Ratangarh; (ii) near mega highway Sardarsahar which is owned by Pinjrapole Society (Gaushala Trust) Ratangarh and (iii) at west of Main Ginani, which is forest land. The of capacity of these RWRs are designed based on average rainfall in the area these will protect overflowing of storm water facilitate distribution of raw water to users.

Screening and Categorization assessment of potential impacts. Ratangarh town storm water drainage subproject is classified as environmental category B 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. Per Government of India environmental impact assessment (EIA) Notification, 2006, subproject do not require environmental clearance. These works will require advance permission from concerned authorities namely Railways, Nagar Palika (Ratangarh) and NH-PWD (Bikaner division) for road cutting and traffic diversion etc.

[1] Ginani is a natural storage pond or depression. There are several such ponds in Ratangarh, of which Main Ginani is a prominent one.

Description of the Environment. Subproject components are in Ratangarh town and in its immediate surroundings which were converted into urban use for many years ago, and there is no natural habitat left at the proposed subproject sites. The subproject sites are located in existing road right of way (RoW) and government-owned lands. (i) Rising mains from SWPS No. 4 (Main Ginani) to Disposal point 3 (West of Main Ginani,) and (ii) Rising main crossing to NH-52 and Disposal point 1 falls in the protected forest land " Kasba Ratangarh Forest". Approximately 0.15 ha forest area is required for this subproject component. The forest land diversion is required and it will be taken from MOEF&CC Regional office Jaipur. There are no ASI or state protected monuments within the project influence zone. The nearest ASI monument is Harshnath Temple on Harsh Hill in Sikar at 83 km distance in south-east direction, and the nearest state protected monuments is Fatehpur Fort in Fatehpur Town at 32 km distance in south-east direction. No tree cutting will be required as per preliminary design, however, if any tree felling is required measures like compensatory plantation in the ration of 1: 3.

Potential Environmental Impacts and Mitigation measures. In this draft IEE, negative impacts were identified in relation to location, design, construction and operation of the improved infrastructure. Environmental impacts as being due to the project design or location were not significant as various measures are already included in site planning and preliminary design. No impacts on archaeological resources envisaged. Temporary measures suggested to avoid any disturbance / damage to buildings during construction of drainage system in nearby roads. Potential impacts were identified in relation to location, design, construction and operation of the improved infrastructure. During the construction phase, impacts mainly arise from the need to dispose of waste soil and disturbance of residents and traffic. Site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b)ensuring all workers are provided with and use personal protective equipment;(c) OH&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; etc to be developed and implemented during construction phase. Measures against traffic accidents and vehicle collision with pedestrians - Road signage, public information, hard barricades and deploy security personnel are considered for community safety during construction phase. No Asbestos Cement Material (ACM) is proposed to be used in the subproject construction. Two SWPS sites are selected in low-lying lands that are technically suitable for pumping stations. Two of these selected sites (SWPS-4 & SWPS-5) are currently filled with rain water, wastewater and solid waste, clearance of which is necessary for construction of SWPS. Considering the potential harmful conditions due to accumulated wastewater and solid waste, and potential for generation of gases, measures are needed to safeguard and health and safety of workers and close by people. Accumulated solid waste also need to be disposed properly.

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. Except for drainpipes, all other construction activities will be confined to the selected sites and the interference with the general public and community around is minimal. In these works, the temporary negative impacts arise mainly from construction 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. Drainage works will be conducted along public roads in an urban area congested with people, activities and traffic. Therefore, these works may have adverse, but temporary 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.

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 drainage works to minimize public inconvenience; (ii) measures to avoid impacts on heritage building and chance find procedures (iii) barricading, dust suppression and noise control measures; (iv) traffic management measures for works along the roads and for hauling activities; (v) occupational and community health and safety, labour welfare, (vi) provision of walkways and planks over trenches to ensure access will not be impeded; (vii) reuse of excavated materials to extent possible, (viii) 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 kept on-site during the construction period at all times. The EMP will be included in bids and contracts, and implementation shall be binding on contractors.

Implementation Arrangements. The executing and implementing agencies will remain unchanged from the current project, which are Government of Rajasthan's Local Self Government Department (LSGD) and Rajasthan Urban Drinking Water, Sewerage and Infrastructure Corporation (RUDSICO), respectively. The AF project retains the project management unit (PMU) at the implementing agency, as well as the two Zonal Offices in Jaipur and Jodhpur. Project implementation units (PIUs) have been established in project towns. A total of eight PIUs will manage 18 ULBs under the AF Project. Consultants will support the PMU and PIUs. Project Officer (Environment) at PMU and Safeguard and Safety Officer at each of the PIUs will be responsible for environment management and monitoring activities and will be supported by Safeguard support staff from Supervision Consultant, town staff/team and Environment Safeguard Specialist of Supervision Consultants. Contractor personnel will also include an Environment, Health and Safety (EHS) Engineer in the project construction team.

Consultation, Disclosure and Grievance Redress. The stakeholders were involved in developing the IEE. Informal and formal consultation are conducted with local population of the area at 8 places along with proposed alignment with about 54 persons in month of March and April 2022. A City Level Committee (CLC) was held and CLC has appreciated and approved the subproject. The IEE will be made available at public locations; this draft IEE will be disclosed to a wider audience via the ADB and RUDSICO websites. Consultation process will continue during project implementation. A grievance redress mechanism (GRM) will be established to redress public grievances.

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 CMSC, 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 RUDSICO 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 Ratangarh will be the major beneficiaries. The subproject is primarily designed to improve environmental quality and living

conditions of Ratangarh Town through provision of improvement of drainage system. The benefits arising from this subproject include: (i) Improved drainage system will result in the better environmental conditions of city, (ii) improved public health particularly reduction in vector borne and infectious diseases, (iii) people would spend less on healthcare and lose fewer working days due to illness, so their economic status, as well as their overall health should also improve.

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). This IEE needs to be updated during the detailed design, reviewed and approved by ADB, and disclosed prior to start of construction.

I. INTRODUCTION

A. Rajasthan Secondary Town Development Section Project – Additional Financing

1. Sector Project (RSTDSP, Loan 3972: IND) from its regular ordinary capital resources on 25 September 2020 and became effective on 4 January 2021. The closing date of the current project is 31 May 2028. This project is on track and has performed well consistently since the first quarter of 2021. Under this project, water supply systems are being improved in eight urban local body (ULB) towns (Output 1), and sanitation systems in 13 ULBs (Output 2). During the implementation, an additional 13 ULBs were added to the project for fecal sludge and septage management system development. Under Output 3, capacity building and training activities on sustainable and resilient water supply and sanitation (WSS) operations, hygiene, gender equality and social inclusion conducted.

2. The additional financing (the project) will expand the improved access to WSS services in at least ten urban local bodies (ULBs), benefiting 1.2 million people. Important value addition of the proposed project to the ongoing project is that it will provide innovative solutions to address climate change to respond to the growing climate risks and vulnerability and also to improve livability and prosperity through enhancing natural and/or built heritage at least ten ULBs in Rajasthan, benefiting 1.0 million people. The overall project is aligned with the following impacts: (i) access to potable, affordable, reliable, equitable, environmentally sustainable drinking water supply in all urban areas of Rajasthan improved, (ii) health status of urban population, especially the poor and under-privileged improved, and (iii) productivity, livability and prosperity for the citizens in Rajasthan cities and towns enhanced. Reflecting the additional measures to enhance climate resilience and heritage-sensitive urban development of the project, impact statement (iii) was added; the outcome statement is modified as quality, reliability, equity, and sustainability of urban assets and services in project towns of Rajasthan improved; and additional output was also added, resulting in four outputs.

(i) **Output 1: Resilient water supply systems developed or improved.** By 2028, the project will (i) At least 1,300 km of water supply pipelines will be commissioned through a district-metered area approach for effective non-revenue water (NRW) management, (ii) at least 79,000 households will be connected to an improved water supply system, including at least 95% below poverty line households, with 100% functional meters allowing for the introduction of volumetric billing, (iii) three new water treatment plants (WTPs) will be commissioned with a total capacity of at least 24 million liters per day (mld).

(ii) **Output 2: Resilient and inclusive sanitation systems developed or improved.** By 2028, (i) at least 500 km of sewers will be constructed; (ii) seven sewage treatment plants (STPs) with co-treatment of wastewater and fecal sludge and with a total capacity of at least 30 mld will be commissioned and one existing STP with 10 mld capacity will be upgraded to meet current effluent standards; and (iii) at least 54,000 new household connections (including at least 95% below poverty line households) to the sewer system will be installed.

(iii) **Output 3: Urban assets to enhance climate resilience and heritage living developed or improved.** By 2028, (i) at least 50 km of drainage networks will be constructed in five ULBs; (ii) at least five either kunds or baories rehabilitated and/or reconstructed in three ULBs that were heritage structures built for drainage, rainwater harvesting, and reuse, but currently are not properly functioning; (iii) five water parks rehabilitated in one ULB to enhance water retention and storage capacity and/or to improve people's well-being, both residents and visitors; and (iv)

at least four heritage structures are refurbished in five ULBs to improve the living environment and attract more tourists.

(iv) **Output 4: Institutional and human capacities strengthened for sustainable service delivery, gender equality, and improved public health**.

3. The executing and implementing agencies will remain unchanged. GOR's Local Self Government Department (LSGD) is executing agency and the Rajasthan Urban Drinking Water, Sewerage and Infrastructure Corporation (RUDSICO) is implementing agency.

4. **Ratangarh Drainage subproject**. This is one of the subprojects proposed under RSTDSP-AF. It will improve drainage system in the town.

B. Purpose of Initial Environmental Examination Report

5. 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 (Appendix 1), 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

6. The subproject is proposed for implementation under the small works modality. The IEE is based mainly on field reconnaissance surveys and secondary sources of information. No field monitoring (environmental) survey was conducted; however, the environmental monitoring program developed as part of the environmental management plan (EMP) will require the contractors to establish the baseline environmental conditions prior to commencement of civil works. Stakeholder consultation was an integral part of the IEE. This IEE will be updated during the pre-construction phase to reflect any 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

7. This Report contains the following sections:

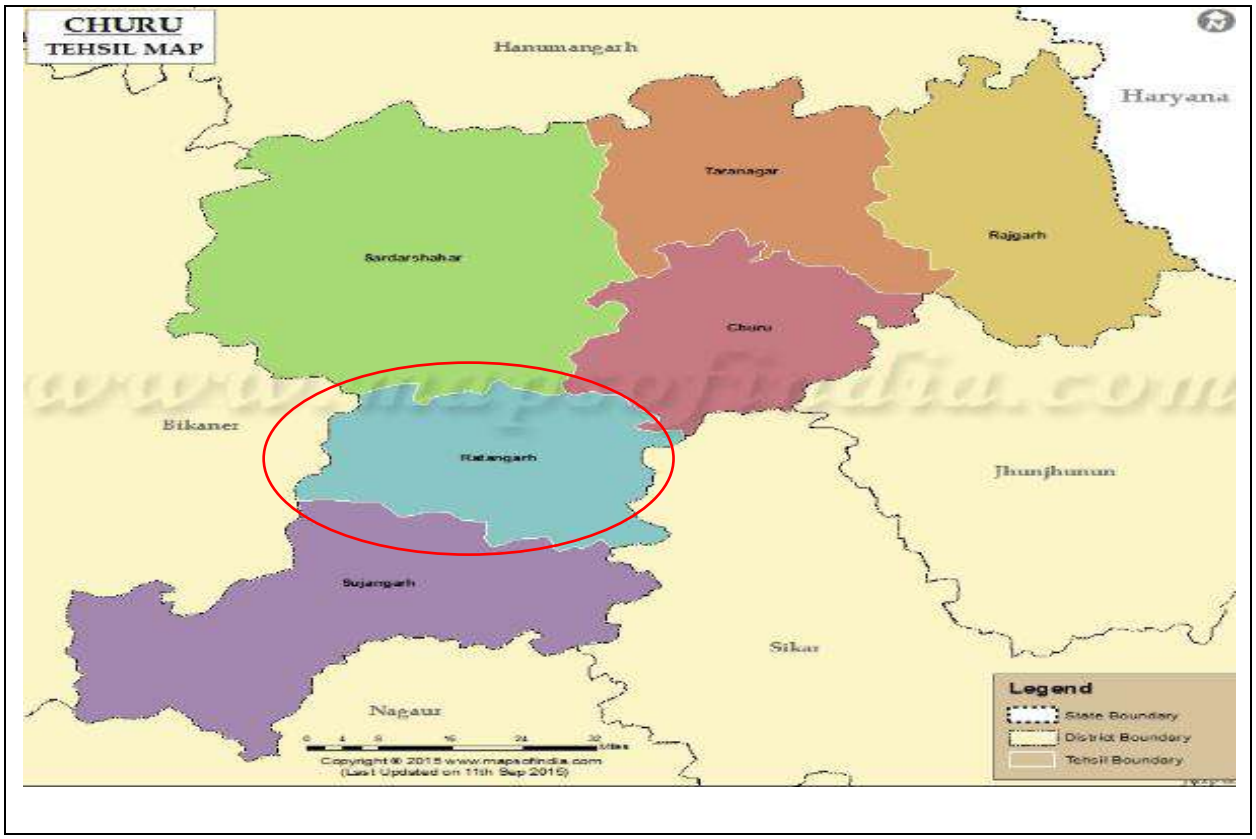
Executive summary;
(i) Introduction;
(ii) Description of the project;
(iii) Analysis of alternatives;
(iv) Policy, legal and administrative framework;
(v) Description of the environment;
(vi) Anticipated environmental impacts and mitigation measures;
(vii) Public consultation and information disclosure;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

II. DESCRIPTION OF PROJECT

A. Ratangarh Town

8. **Location, Area and Connectivity:** Ratangarh is a town in Churu district of Rajasthan in India. It is part of Shekhawati region. Ratangarh is situated 200 km off Jaipur in the north and connected by National Highway NH-52. There are so many temples in Ratangarh that it has earned the nickname "the Varanasi of Rajasthan". Salasar Balaji, the most famous and widely popular religious spot in the District is situated 45 km south-east of Ratangarh. Ratangarh is located at 28.08°N 74.6°E with an average elevation of 312 m above the mean sea level. Ratangarh is well connected with rail and road networks. Ratangarh has direct rail connectivity with major cities of India including Delhi and state capital Jaipur, Jaisalmer, Bikaner, Jodhpur and other major cities. Ratangarh is connected with NH -11 which connects it with Bikaner, Jaipur and Agra.

FIGURE 1: DISTRICT MAP CHURU SHOWING RATANGARH TOWN



Source: District map of Churu District (Rajasthan portal)

B. Existing Infrastructure Conditions of the Town

1. Water Supply

9. Tube wells and open wells are the main sources of drinking water in Ratangarh town, which are maintained by the Public Health Engineering Department. Total water supply from tube wells and open wells in the town is 3500 KLD, which corresponds to 44 liters per capita per day. The town gets drinking water from 26 open wells and 58 tube wells. There are 10 ESRs in the city

for distribution of water. It is very important from the integrated water resources management perspective to understand the water resource potential and its sustainability. Water supply service is the highest priority for people of Ratangarh. PHED and Ratangarh Municipal Board always put the service at the first place while framing any plan for the city. Ratangarh PHED also prepared water management and augmentation plan with the financial aid from GoI & GoR.

10. The population forecast and demand calculations have been done for 2011, 2041 and also for mid-year,2026. The rising mains and distribution system have been designed for plan horizon year, but pumping machinery and the reservoirs, where phasing is possible, have been proposed for 2026. Till the PHED makes arrangement for deficit water from PMC Ratangarh, water received from PMC Ratangarh and by increasing production from existing tube wells and open wells by replacing pumping machineries will have to be utilized to enhance the service level to 135 lpcd.

2. Sewerage

11. At present, Ratangarh Municipality does not have no operational existing sewerage system but there is under construction sewerage subproject and will be commissioned in 2025. Details of under construction sewerage subproject under RUIDP-IV are attached as **Appendix 2.** Presently the wastewater from kitchens and bathrooms is discharged into roadside drains. Open defecation is not uncommon. Most of the residential buildings, commercial buildings, and educational institutions have on-site septic tanks. The effluent from the septic tanks is directly let into the open drains. Untreated wastewater and septic tank effluent that is discharged into roadside open drains is accumulated in the low-lying areas in the outskirts of the town. Indiscriminate solid waste disposal is prevalent in the town. Low lying areas are filled with wastewater and solid waste. In the absence of a safe collection and disposal system for sewage, the people of Ratangarh are facing unhealthy and unhygienic environmental conditions therefore public representatives are also demanding facilities of sewerage system on priority basis.

3. Solid waste Management

12. The MSW generated in Ratangarh city (including slum areas) mainly consists of domestic refuses, waste from commercial areas, fruit & vegetable market, bio-medical waste, and waste from hotels & restaurants, etc. The waste collection system in the town is very primitive – individual households throw the garbage on roadside/open drains close to their houses and the sweepers collect the garbage in the form of small heaps on road side. Similarly, the open drains are also cleaned periodically, and the sludge is heaped adjacent to the drain where it is left for 2-3 days to get dried and lifted. Tractor trolleys then lift them and dump once or twice in a day. In the process, part of garbage gets spilled on the road and finds its way in open drains or open low-lying areas (pits).

4. Existing Drainage System of Ratangarh

13. The works of storm water drainage of Ratangarh town were taken up in stages; the first works were executed in early 1970s. The initial works included roadside drains, and pumping stations were added later in stages. Storm water drainage system in Ratangarh was not upgraded or improved recently or in recent past and is not under consideration for improvement under any other scheme, except under this ADB funded proposed drainage subproject.

14. Presently there exists a network of storm water drains. The existing network of roadside storm water drains in Ratangarh has been identified under three broad categories as follows: (i) open pucca drains, (ii) closed pucca drains, and (iii) kutcha drain.

15. The town has an undulating profile with sand dunes here and there. The land profile of the town is such that depressions are found at many places and hence storm water from existing drains accumulates in various depressions/natural storage ponds (known as Ginani) within the town. As such, there is no definite slope in the town providing smooth drainage outside the municipal area. . The problem gets further aggravated due to low water percolation on account of deposition of silica / silt / fine sand in the subsoil, which forms an impervious layer due to the clogging of pores after mixing with storm water silt. The surface runoff along with wastewater from rest of the town is also accumulated at several low-lying areas, forming unhygienic ponds/pools (locally called Ginanies). The rainwater remains stagnant for a long time in the low-lying areas and causes hardship to the inhabitants and creates unhygienic conditions. The general drainage of Ratangarh town is collected in 6 major depressions (ponds) through open drains / flowing on road. Six major areas where ponding occurs are –(i) near Railway Quarter, (ii) at Saraf Sump Well, (iii) at Parmana Taal, (iv) at Main Ginani, (v) near BSNL Office and (vi) near Hanuman Park.

16. Main Ginani and Ginani at BSNL Office are two majors naturally storm water storage areas in the mid of Ratangarh City. Both areas are depression areas and by gravity storm water is stored. During the monsoon season both Ginani are overflow from storm water and due to this nearby colonies are water sub merged and flood like conditions are generated. Due to the water submerging condition, entire Ratangarh City is almost disconnected from other areas. There is no proper facilities for water evocation from Ginanis and it led to create odour and unhygienic conditions in the surrounding areas. These Ginanis are also full of municipal solid waste, coming with storm water and sewerage from town area.

17. The existing storm water drainage system comprises secondary drains (streams and artificial drains) and tertiary drains (mostly roadside drains). The absence of appropriate disposal of storm water has led to gross contamination and creates unhygienic conditions in surrounding areas of ponding. The major problems of the existing drainage system of Ratangarh town are: (i) **Inappropriate design**: The drains are not designed adequately to carry rainwater. It is of lesser capacity than required in most of the places and hence it overflows resulting in water logging in nearby areas; (ii) **lack of proper alignment along roads**: Roadside drains are not provided resulting water collecting in roadsides or in front of houses/shops; (iii) **siltation**: Since most of the drains are open, a lot of silt gets into the drains and reduces the section for flow. Choking at culverts is common; (iv) **municipal solid waste**: The municipal solid waste like garbage, polythene, plastic carry bags etc. are seen littered in the drains. It is observed that regularly solid waste is dumped in the drains near culverts; (v) **lack of adequate drainage outlets**: existing outlets shared between sewerage and drainage due to site constraints. In the aftermath of a rainstorm event, the combined flows are unable to pass through the drains. Lack of maintenance also is a contributory cause for reduced water passage area; (vi) **blockage of drains** by weeds, vegetation and solid waste material.

18. The conditional assessment of the pumping stations shows that they are in very poor physical condition**.** Civil structures are badly deteriorated. There are 6 nos. existing pumping stations namely. Out of 6 pumping stations, 3 nos. pumping stations (SWPS-2, 4 & 5) are more than 27 years old and the civil structures are close to reach their design life. Others are relatively newer but the physical condition of civil structures is very poor. Pumping machineries are also being managed by frequent repairs. The result is, all the existing pumping stations need to be replaced.

5. Existing SWPS-1 Near Railway Quarter

19. It is located southward of the town. Pumps are used for the pumping of storm water since the year 2010. The catchment includes area around Railway Colony and Saith Baijnath Bhartiya Govt. Secondary School. Most of the drains in this catchment are unlined, badly silted and subjected to encroachment at many places with no access left for cleaning. Incoming drains to this Ginani are aligned into the pumping station through manual screens. Details of pumping station and rising main are presented below.

No. of pumps	2 Nos. (Monoblock)
Capacity of pumps	14 KW (each)
Head	30 m
Discharge	14 LPS
Year of Commissioning	2010
Rising Main	90 mm dia, HDPE, 900 m length
Disposal Point	SWPS-1 to SWPS-5 to (near) 3.8 MLD STP

20. This pumping station pumps the storm water to SWPS-5, located approx. 900 m towards the north. SWPS-5 further pumps this rain water, along with the rain water from its own catchment, to the final disposal point near under construction 3.8 MLD STP towards the south. The rising main is of HDPE pipe material, 90 mm dia, and 900 m length. The physical condition of the pump house and pumping machinery is very poor. The rising main is damaged at many places and as such, new pumping station and rising main are required**.**

21. Flooding on the Station Road due to accumulation of storm water in the above pond is shown in the photograph presented below.

Figure 2: Photographs of the Existing SWPS – 1

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photograph showing flooding on the Station Road</td><td>SWPS-1 Existing Locating</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photograph of SWPS-1</td><td>Panel condition of SWPS-1</td></tr>
</table>

6. Existing SWPS-2 Near Saraf Sump Well

22. This pumping station is also located southward of the town and it was constructed in the year 1995. The civil structure comprises a pump room to house the pumps, panel, switchboard, etc., and a sump outside along the road **(see figure below).**

23. This pumping station pumps the storm water to the disposal point near the under constructing existing 3.8 MLD STP, about 1.63 km towards the south. The rising main is of AC pipe material, 200 mm dia., and 1.63 km length. The physical condition of the pump house and pumping machinery is very poor. Reportedly, the rising main is damaged at many places and as such, new pumping station and rising main are required.

24. Most of the drains in this catchment are unlined. Regular flooding causes unhygienic conditions. Details of pumping station and rising main are presented below.

No. of pumps	2 Nos. (Centrifugal)
Capacity of pumps	11 KW (each)
Head	25 m
Discharge	36 LPS
Year of Commissioning	1995
Rising Main	200 mm dia., AC pipe, 1.63 km length
Disposal Point	Near 3.8 MLD STP

Figure 3: Photographs of the Existing SWPS – 2

Photograph showing pump room of SWPS-2

Photograph showing sump of SWPS-2

Another view of SWPS-2 sump at Saraf Sump Well

Pump condition of SWPS-2 sump at Saraf Sump Well

7. SWPS-3 at Parmana Taal

25. This pumping station is located centrally eastward of the town. The pump room was initially used as a water kiosk (locally called “pyau”), which was converted into a pump room in the year 2016. The physical condition of the civil structure is extremely poor (refer photographs below).This pumping station pumps the storm water into a drain from where it is discharged into Main Ginani pond. The rising main is of HDPE pipe material, 150 mm dia., and 500 m length. The physical condition of the pump house and pumping machinery is very poor. Reportedly, the rising main is also damaged at many places and as such, new pumping station and rising main are required.

26. The catchment includes area around Government School, Choudhary Well and E.G. Office Campus. The rainwater is collected at the pump house and drained into Main Ginani pond from where it is further pumped to the disposal point on the west, property of Pinjrapole Society. Most of the drains in this catchment are unlined. Regular flooding causes unhygienic conditions. Details of the pumping station and rising main are presented below.

No. of pumps	2 Nos. (Monoblock)
Capacity of pumps	28 KW (each)
Head	42 m
Discharge	22 LPS

Year of Commissioning	2016
Rising Main	150 mm dia., HDPE, 500 m length
Disposal Point	SWPS-3 to Drain (300 mm x300 mm) to Main Ginani

Figure 4: Photograph of the SWPS – 3 Site

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photograph showing pump room of SWPS-3</td><td>Another view of pump room of SWPS-3</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Panel condition of SWPS-3</td><td>Physical condition of SWPS-3 sump at Parmana Taal</td></tr>
</table>

8. SWPS-4 at Main Ginani

27. This pumping station is located westward of the town and it was constructed in the year 1975-1976. The civil structure comprises a pump room to house the pumps, panel, switchboard, etc.

28. This pumping station pumps the storm water to the disposal point in northwest area of the town, which is a Forest Land, 1.55 km towards the west. The rising main is of AC pipe material, 300 mm diameter and 1.55 km length. As can be seen in the photographs below, the physical condition of the pump house and pumping machinery is very poor. Reportedly, the rising main is damaged at many places and as such, new pumping station and rising main are required.

29. The catchment includes area around Ramchand Park, Mochi Well, and Central Academy. Most of the drains in this catchment are unlined. Regular flooding causes unhygienic conditions. Details of pumping station and rising main are presented below.

No. of pumps	2 Nos. (Centrifugal)

Capacity of pumps	37.3 KW (each)
Head	30 m
Discharge	69.44 LPS
Year of Commissioning	1975-1976
Rising Main	300 mm dia., AC, 1550 m length
Disposal Point	Forest Land

Figure 5: Photograph of the SWPS-4 at Main Ginani

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photograph showing Main Ginani and SWPS-4</td><td>Photograph showing sump and pump of SWPS-4</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photograph showing sump of SWPS-4</td><td>Panel condition of SWPS-4 sump at Main Ginani</td></tr>
</table>

9. SWPS-5 near BSNL office

30. his pumping station is located southward of the town and it was constructed in the year 1992. The civil structure comprises a pump room to house the pumps, panel, switchboard, etc., and a sump outside along the road

31. This pumping station pumps the storm water to the disposal point near existing 3.8 MLD STP, 2.23 km towards the south. The rising main is of AC pipe material, 250 mm dia., and 2.23 km length. The physical condition of the pump house and pumping machinery is very poor. Reportedly, the rising main is damaged at many places and as such, new pumping station and rising main are required.

32. The catchment includes area around BSNL Office, Goga Mandi, Post Office, etc. Most of the drains in this catchment are unlined. Regular flooding causes unhygienic conditions. Details of pumping station and rising main are presented below.

No. of pumps	2 No. (Centrifugal)
Capacity of pumps	37.3 KW (each)
Head	30 m
Discharge	69.44 LPS
Year of Commissioning	1992
Rising Main	250 mm dia., AC, 2230 m length
Disposal Point	Near 3.8 MLD STP

Figure 6: Photograph of the SWPS-5 Near BSNL office

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photograph of SWPS-5</td><td>Photograph showing pump room of SWPS-5</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photograph showing sump of SWPS-5</td><td>Panel condition of SWPS-5 sump at BSNL Office</td></tr>
</table>

10. SWPS-6 Near Hanuman Park

33. It lies to the north-east of the town. The catchment includes Mandawa Road, backside of Pinjara Pole, and Old Railway Puliya, etc. Most of the drains in this catchment are unlined. Regular flooding causes unhygienic conditions. The capacity of existing pumps is given below –

No. of pumps	2 Nos. (Centrifugal)
Capacity of pumps	6 KW (each)

34. As per the information provided by ULB there is no existing pump house. Pump attached with Tractors are being used to dispose of the storm water during rains. Tankers are filled by using diesel pumps

Figure 7: Photograph of the SWPS-6 Near Hanuman Park

35. **Holding Capacity of Ponds.** The holding capacity of the ponds are :

Table 1: Holding Capacity of Ponds

Sl. No.	Ponds	Area (Sqm)	Depth (m)	Volume (cum)	Max. Water Level (m)
1	Main Ginani	15601.59	2.5	39003.98	308.20
2	Near BSNL Office	1707.33	3	5121.99	308.40
3	Near 3.8 MLD STP	22982.31	2.5	57455.78	-
4	Near Railway Quarter	6877.74	2	13755.48	308.70

Figure 8: Ratangarh Existing Drain Area

Source: Detailed Project Report-Ratangarh, 2022

C. Proposed Project

51. **The project area** encompasses the municipal area of Ratangarh Town including the disposal points in the periphery of the town. The project identifies major areas/pockets within the town that get impacted due to the flooding caused by excess rainwater collected in the depressions / ponds / Ginanis. Areas/locations have been identified for safe disposal of the flood water by pumping.

52. A detailed survey (topographical & geotechnical) along with numerous site visits and detailed discussions with concerned persons of ULB and town administration were conducted to provide a long term & sustainable solution to the problem.

53. An average 5 cm for 24 hours rainfall for a return period of 1.5 years as per provision and guidelines of IRC SP-42:2014 has been adopted for the design. Rainfall data of 50 years (1971-2000) has been used to arrive at the rainfall intensity.

54. Ratangarh town drainage subproject is one of the subprojects proposed under the investment component of RSTDSP-additional financing. Works which will be executed under this drainage package include –

(i) Control of storm water flooding by constructing six Storm Water Pumping Stations (SWPS) : (a) SWPS-1 of 1.1 million liter per day (mld) near Railway Quarter, (b) SWPS-2 of 2.3 mld at Saraf sump well, (c) SWPS-3 of 4.6 mld at Parmana Taal, (d) SWPS-4 of 10 mld at Main Ginani, (e) SWPS-5 of 10 mld near BSNL office, (f) SWPS-6 of 1.1 mld near Hanuman Park;

(ii) Laying of rising mains of 10,127 km of diameter 150-400 mm from SWPS to nearby identified open area (govt. land) for distributed disposal locations: (a) near mega highway Sardarsahar which is owned by Pinjrapole Society (Gaushala Trust) Ratangarh; (b) west of Main ginani, which is forest land and (iii) towards south of national highway-11 owned by Nagar Palika; Ratangarh

(iii) Interconnection of pumping station to divert excess storm water during heavy rains. SWPS-2 at Saraf sump well to SWPS-1 near Railway quarter)

(iv) Construction of Raw Water Reservoir (3 nos. each of 30 ML capacity) for reuse of storm water at disposal points: (a) Disposal Point -1 near mega highway Sardarsahar (Gaushala Trust) (b) Disposal Point -2 on forest land disposal point and (iii) Disposal Point -3 near south of NH -11. The of capacity of these RWRs are designed based on average rainfall in the area these will protect overflowing of storm water and facilitate distribution of raw water to users.

(v) Construction of gravity mains of 960 meter of diameter 600mm to channelize flow to SWPS inlet at main Ginani and near Hanuman Park SWPS.

(vi) road restoration.

55. Details of works proposed are presented in Table 2 to Table 4.

56. Storm Water Pumping Station (SWPS).6 nos. storm water pumping stations (SWPS) have been proposed in this project and details are tabulated below:

Table 2: Details of proposed Storm Water Pumping Stations (SWPS)

S. No.	SWPS No.	Location of SWPS	Capacity (MLD)	Pump Capacity (m^3/hr)		
				Peak Flow	Avg. Flow	Lean Flow
1.	SWPS-1	Near Railway Quarters	1.1	425.00 (1 No.)	141.67 (2 No.)	70.83 (2 No.)
2.	SWPS-2	Saraf Sump Well	2.3	287.50 (1 No.)	95.83 (2 No.)	47.92 (2 No.)
3.	SWPS-3	Parmana Taal	4.6	479.17 (1 No.)	191.67 (2 No.)	95.83 (2 No.)
4.	SWPS-4	Main Ginani	10.0	937.50 (1 No.)	416.67 (2 No.)	208.33 (2 No.)
5.	SWPS-5	Near BSNL Office	10.0	937.50 (1 No.)	416.67 (2 No.)	208.33 (2 No.)
6.	SWPS-6	Near Hanuman Park	1.1	137.50 (1 No.)	45.83 (2 No.)	22.92 (2 No.)

Source: Detailed Project Report-Ratangarh, 2022

57. **Rising Main.** The rising mains comprise providing and laying DI K-9 pipe for disposal of storm water. Details are as follows:

Table 3: Details of Rising Mains

From	To	Pumping Length (m)	Pumping Dia (mm)	Class of Pipe
SWPS-1 (Near Railway Quarter)	Disposal Point-3, south of national highway-11 owned by Nagar Palika; Ratangarh	2176	250	DI K-9
SWPS-5 (Near BSNL Office)	Disposal Point-1, Gaushala Land - Pinjrapole Society) near mega highway Sardarsahar	3612	400	DI K-9
SWPS-3 (Parmana Taal)	Disposal Point-2, Forest land- west of Main Ginani,	1978	300	DI K-9
SWPS-4 (Main Ginani)	Disposal Point-2, Forest land- west of Main Ginani,	1108	400	DI K-9
SWPS-6 (Near Hanuman Park)	Main Ginani through pumping in the existing drain	530	150	DI K-9
SWPS-2 (Saraf Sump Well)	SWPS-1 (Near Railway Quarter) (for Interconnection of pumping stations to divert excess storm water during heavy rains)	723	200	DI K-9

Source: Detailed Project Report Ratangarh, 2022

58. **Gravity Drain.** Gravity Drain of RCC NP4 pipe is proposed at SWPS Main Ginani and near Hanuman Park for channelizing flow of storm water to proposed SWPS.

Table 4: Details of Gravity Main

S. No.	Size (mm)	Length (m)	Location
1.	600	602	SWPS Main Ginani
2.	600	358	SWPS Near hanuman Park
	Total	**960**	

Source: Detailed Project Report-Ratangarh, 2022

59. **Existing and Proposed Storm water Disposal Points.** At present, the storm water is accumulated at following areas (depressions) from where is pumped to disposal point near on-going 3.8 MLD STP and in the forest land. As there is no natural disposal drain for the town, the disposal of various ponds has been distributed in various directions of the town to avoid flooding during the rains.

60. Areas/locations have been identified for safe disposal of the flood water by pumping and construction of 3 raw water reservoirs by a detailed survey (topographical & geotechnical) along with numerous site visits and detailed discussions with concerned persons of ULB and town administration. The details of various disposal points (existing/proposed) are as follows:

Table 5: Details of Disposal Points

S. No.	Location of Pumping Station	Existing Disposal Location	Proposed Disposal Location
1.	Near Railway Quarters (SWPS1)	Near 3.8 MLD STP Land	In Municipal Land, South of NH -11 Total available are is approximately 22257 sq. m and required area for raw water reservoir is 10200 sq. m
2.	Existing SWPS, Saraf Sump Well (SWPS2)	Near 3.8 MLD STP Land	
3.	At Parmana Taal (SWPS3)		Total land required for raw water Reservoirs and disposal site is 10200 m^2 and sufficient land is available for the said work.
4.	At Main Ginani (SWPS4)	Forest Land	
5.	Near Hanuman Park (SWPS6)	Ponding exists	
6	Near BSNL Office (SWPS5)	Near 3.8 MLD STP Land	Gaushala Land – (Pinjrapole Society) near mega highway Sardarsahar. Land required for raw water reservoirs/disposal point is 10200 m^2 and available land is 607020m^2.

Source: Detailed Project Report-Ratangarh, 2022

61. **Raw Water Reservoir (RWR).** Three nos. of Raw Water Reservoirs are proposed at the following locations for utilization of storm water:

- **Disposal Point -1, Govt. Land**
- **Disposal Point-2, Forest Land**
- **Disposal Point-3, near Mega Highway Sardarshahar**

62. Raw Water Reservoirs capacity is 30 ML each and dimension is L (150 m) X B (80 m) XSWD (2.5m), capacity of these RWRs are designed based on average rainfall pattern in the area these will protect overflowing of storm water and facilitate distribution of raw water to users.

63. **Utilization of storm water.** At disposal point-1 (on Govt. Land) storm water is used in the agriculture in Gaushala, at disposal point-2 (on Forest Land) storm water is used by forest and at disposal point-3 it is used in agriculture.

64. Storm water can be used by nearby farmers as per their requirement in consultation with ULB. ULB shall provide necessary arrangement for the reuse, to provide reuse water line with water meter for the nearby farmers.

1. Objectives

The objectives of the scheme are to:

(i) Improve infrastructure facilities and help create durable public assets and quality-oriented services in the city and to create healthy environment.
(ii) To improve gap in existing infrastructure, such as Drainage system of the town to make city infrastructure complete, thus improving the city environment.
(iii) Improvement of town drainage system and thus protecting town roads and improvement of quality of life.
(iv) Promote planned integrated development of the town.
(v) The interventions will enhance the infrastructure in the town and will enhance tourism in town.

D. Proposed Subproject Components

65. Subproject is proposed for implementation under work contract, wherein which the successful bidder will validate design of the proposed drainage systems and components during Service Improvement Plan (SIP) preparation (within three months of contract award) as per updated /changed scope of works/project locations (if any) and revised IEE shall be submitted to ADB for approval and after approval from ADB shall be applicable to contractor throughout the project. Contractor will also conduct Environmental monitoring of baseline conditions of air, noise, water and soil and the same will be reflected in the revised IEE to be prepared during SIP Period. This IEE is revisable document and can be revised anytime during project implementation if there is any considerable change in scope of works, change in location of component, change in cost due to addition or subtraction of components etc. which can change the environmental impacts, and revised IEE shall supersede the earlier version of IEE and shall be contractually applicable to the contractor after approval from RUDSICO-EAP and ADB. Operation and Maintenance period (O&M) is for 5 years. Table 6 shows the nature and size of the various components of the storm water drainage system. Maps of proposed drainage subproject in Ratangarh are shown in Figure 9 to 27.

Table 6: Proposed Subproject Components of Storm water Drainage Works in Ratangarh Town

Infrastructure	Function	Description	Location
Storm Water Pumping Station (SWPS).	Storm water pump stations help to protect areas by pumping away large volume of water to the final disposal point,	6 nos. storm water pumping stations (SWPS) have been proposed in this project The pumping stations shall be circular in shape and shall consist of an inlet chamber, coarse screen chamber and a wet well.	**SWPS 1 (Near Railway Quarter)** The area is located southward of the town. Storm water pumping station will be constructed within the vacant

Infrastructure	Function	Description	Location
	thereby preventing occurrence of flooding . They are placed in areas where water cannot be moved by gravity; the energy for pump station is needed to move the water out of these areas.	Non-clog Sewage Submersible Pumps will be installed in the wet-well. All electrical equipment like transformers, DG set, etc. shall be installed at a suitable distance from the wet well. All pumping stations shall comprise RCC Wall Construction having RCC Base Raft Slab and Floor. The present / natural ground level has been raised up to road level to prepare FGL and further top of walls is kept 500 mm above that FGL so as to make the site free from flooding. **1. SWPS 1 (near Railway Quarter)** • Storm water pumping station (SWPS) of 1.1 MLD capacity is proposed here. Total land required is 100 m^2 and sufficient land 6867.74 m^2 is available for SWPS work. .No. of pumps: 2 nos. (submersible) Capacity of pumps :10 KW (each) **2. SWPS 2 (Saraf Sump Well)** Storm water pumping station (SWPS) of 2.3 MLD capacity will be constructed near existing pumping station. Total land required for SWPS is 127 m^2 and 215.33 m^2 land is available No. of pumps : 2 Nos. (submersible) Capacity of pumps : 8 KW (each) **3. SWPS 3 (Parmana Taal)** A 4.6 MLD SWPS is proposed at this location. Total land	area of existing pumping station. The site is near to the Ratangarh Railways Junction and Railway quarters. Identified site is vacant, unused and without any settlement/ squatter or other use The catchment includes area around Railway Colony and area around Saith Baijnath Bhartiya Government Secondary School.. Coordinates: 28°04.'02.70"N; 74°37'32.57"E **SWPS 2 (Saraf Sump Well)** The area lies in the southeast part of the town. Identified site is vacant, unused and without any settlement/ squatter and is adjacent to the existing pumping station at Saraf Sump well Coordinates: 28°04.'10.54"N 74°37'44.18"E **SWPS 3 (Parmana Taal)** This area is located centrally eastward of the town. Storm water pumping station (SWPS) will be constructed in the vacant land, adjacent to the existing pumping station near *Parmana* Taal Identified site is reported vacant, unused and without any settlement/ squatter or other use**.** The catchment includes area around Government School, Choudhary Well and Post Office Campus. coordinate: 28°04.'52.27"N **;** 74°37'43.81"E) **4.SWPS 4 (At Main Ginani)**

Infrastructure	Function	Description	Location
		required for SWPS is 150 m^2 and 165.80 m^2 land is available No. of pumps : 2 Nos. (submersible) Capacity of pumps : 12 KW (each) **4.SWPS 4 (At Main Ginani)** A 10 MLD capacity SWPS is proposed at this location. Total land required for SWPS-4 is 400 m^2 and sufficient land (12519 m2) available here. No. of pumps : 2 Nos. (submersible) Capacity of pumps : 17 KW (each) **5. SWPS 5 (near BSNL Office)** A 10 mld capacity SWPS is proposed here. Total land required for SWPS-5 is 400m^2 and sufficient land 69571 m^2 is available. No. of pump 2 Nos. (submersible) Capacity of pumps : 35 KW (each) **6. SWPS 6 (near Hanuman Park)** • A 1.1 MLD SWPS is proposed at this location. About 150 m^2 land is donated by local residents for SWPS . No. of pumps: 2 Nos. (submersible) Capacity of pumps :6 W (each)	This area is located westward of the town. adjacent to the existing pumping station. i.e. Main Ginani, Ratangarh. The catchment includes area around Ramchand Park, Mochi Well, and Central Academy. Storm water pumping station (SWPS) will be constructed within the vacant area of existing pumping station. (Coordinates : 28°04.'43.14"N N"; 74°36'40.74"E) **5. SWPS 5 (near BSNL Office)** SWPS location is near Ratangarh Head Post Office and BSNL Office and is proposed within the vacant area of existing pumping station near BSNL office. The catchment includes area around BSNL Office, Goga Mandi, Post Office, etc. Coordinates: 28°04.'22.00"N ;74°37'34.91"E **6. SWPS 6 (near Hanuman Park)** It is located to the north-east part of the town. Near Hanuman Park Road, Ratangarh. Nearby landmark is Bachpan Play School at 70 m in north-west direction. The catchment includes Mandawa Road, backside of Pinjara Pole, and Old Railway Puliya(Bridge), etc Coordinates: 28°04.'22.67"N; 74°36'40.17"E

Infrastructure	Function	Description	Location
Rising Mains	Rising Main from Storm Water Pumping Station (SWPS) is proposed upto disposal Point for disposal of storm water	The rising mains comprises providing and laying of DI K-9 pipe of 10.127 km with diameter varying from 150 to 400mm for disposal of storm water.	Proposed alignment will pass through unused /vacant/barren public lands /road ROW of Nagar Palika, Ratangarh. Identified stretches where rising mains are proposed. are reported vacant, unused and without any settlement/ squatter or other use. Rising Main Pipe Line from SWPS-3 (Parmana Taal) to and SWPS 4 (Main Ginani) to Disposal Point 3 at Forest land will cross NH-52 and Disposal Point No.3 falls in the forest land (in Kasaba Ratangarh Forest Block)

Infrastructure	Function	Description	Location
Gravity Drain **A.**	**B.** To channelizing flow of storm water to proposed SWPS	Gravity Drains 960 meter length and 600mm diameter of RCC NP4 pipe are proposed at SWPS Main Ginani and near Hanuman Park.	At Main Ginani and near Hanuman Park SWPS.
Raw Water Reservoir (RWR) at Disposal locations	**C.** 3 nos. of Raw Water Reservoirs for storage of storm water are proposed at disposal locations for utilization of storm water, designed based on average rainfall in the area these will protect overflowing of storm water and facilitated distribution to water users for various non-domestic purposes	Details of disposal locations where raw water reservoirs are proposed: **Disposal point 1: South of National Highway-11** Under this scheme, through pumping main, all the storm water from SWPS 1 (Near Railway Quarter) and SWPS 2 (Saraf sump well) locations will be disposed in the land owned by Municipality, Total available are is approximately 22257 sq. m and required area for raw water reservoir is 10200 sq. m. **Disposal Point-2,** near Mega Highway Sardarshahar - Gaushala Land (Pinjrapole Society) Storm water from SWPS 5 near BSNL office will be disposed of in this land. Land required for raw water reservoirs/disposal point is 10200 m^2 and available land is 607020m^2. **Disposal Point-3**, West of Main Ginani (Forest land) Through pumping main, all the storm water from SWPS-3 (Parmana Taal), Main Ginani (SWPS 4) and SWPS-6 (Hanuman Park) will be disposed of in the land at west of Main Ginani, owned by Forest department. Total land required for raw water Reservoirs and disposal site is 10200 m^2 and sufficient land is available for the said work.	Construction of earthen Raw Water Reservoir (3 nos.) at following Disposal points. **Disposal Point -1**, South of National highway-11 owned by Nagar Palika; Ratangarh. Identified site is reported vacant, unused and without any settlement/ squatter or other use. (Coordinates: 28°02.'59.60"N; 74°37'40.98"E) **Disposal Point-2,** near Mega Highway Sardarshahar - Gaushala Land (Pinjrapole Society) Coordinates: 28°05.'31.68"N; 74°37'10.58"E **Disposal Point-3**, West of Main Ginani (Forest land) Coordinates: 28°04.'48.29"N ; 74°36'11.43"E

Infrastructure	Function	Description	Location
		Proposed Raw Water Reservoirs capacity is 30 ML each and dimension is L(150m) x B (80m) x SWD (2.5m)	

E. Implementation Schedule

36. After the completion of designs, bids were invited in September 2022 for the subproject. After evaluation of bids LOA was issued to successful bidder on 13 January 2023 and thereafter work is awarded. Project duration of work is 18 months. After completion of construction and commissioning, the drainage works shall be handed over to Ratangarh Nagar Palika, who will operate and maintain the drains.

Figure 9: Location of Proposed SWPS and disposal points in Google Earth Map

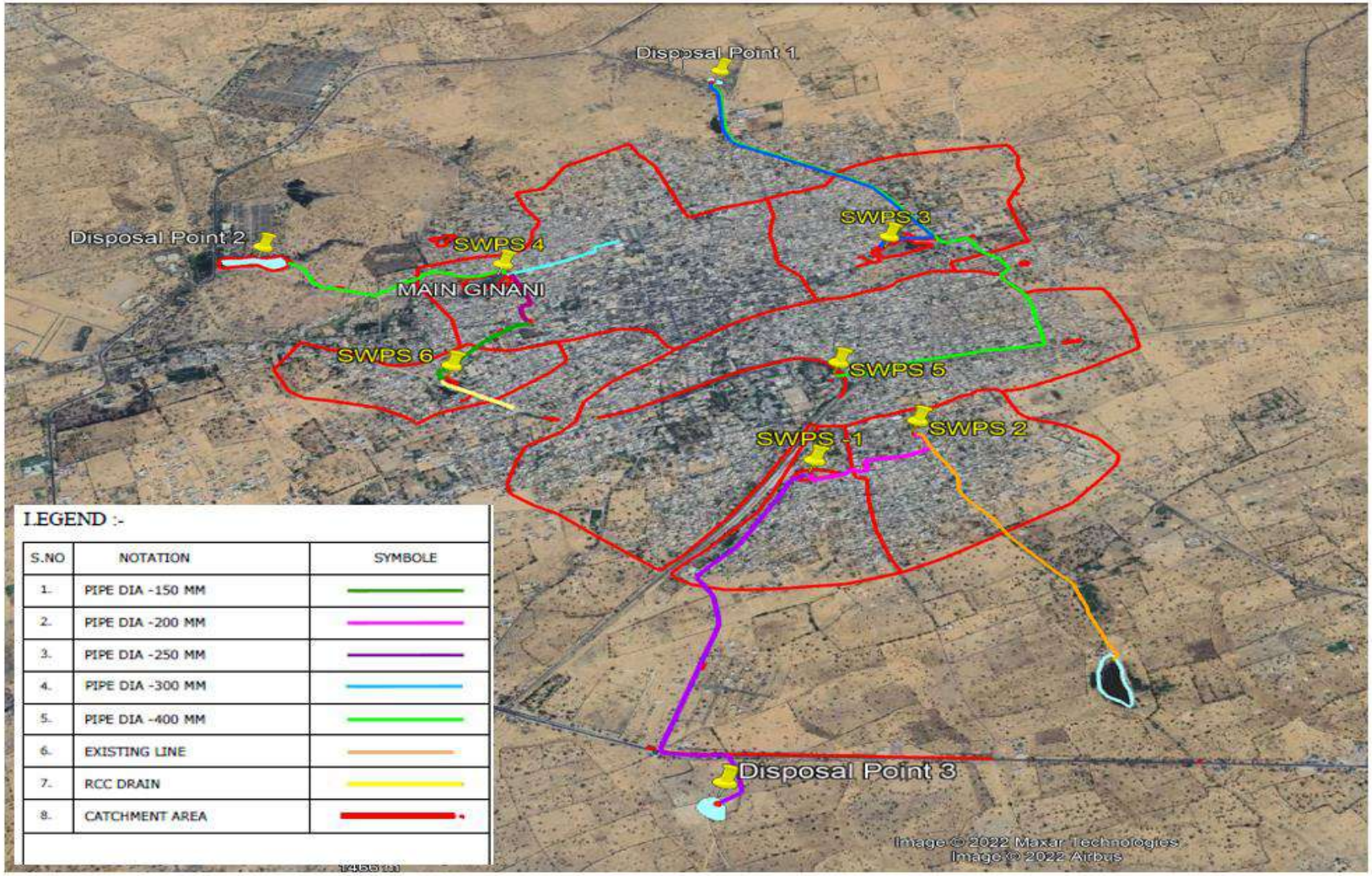


Figure 10: Location of Proposed SWPS, Disposal Points and Forest Area in Google Earth Map

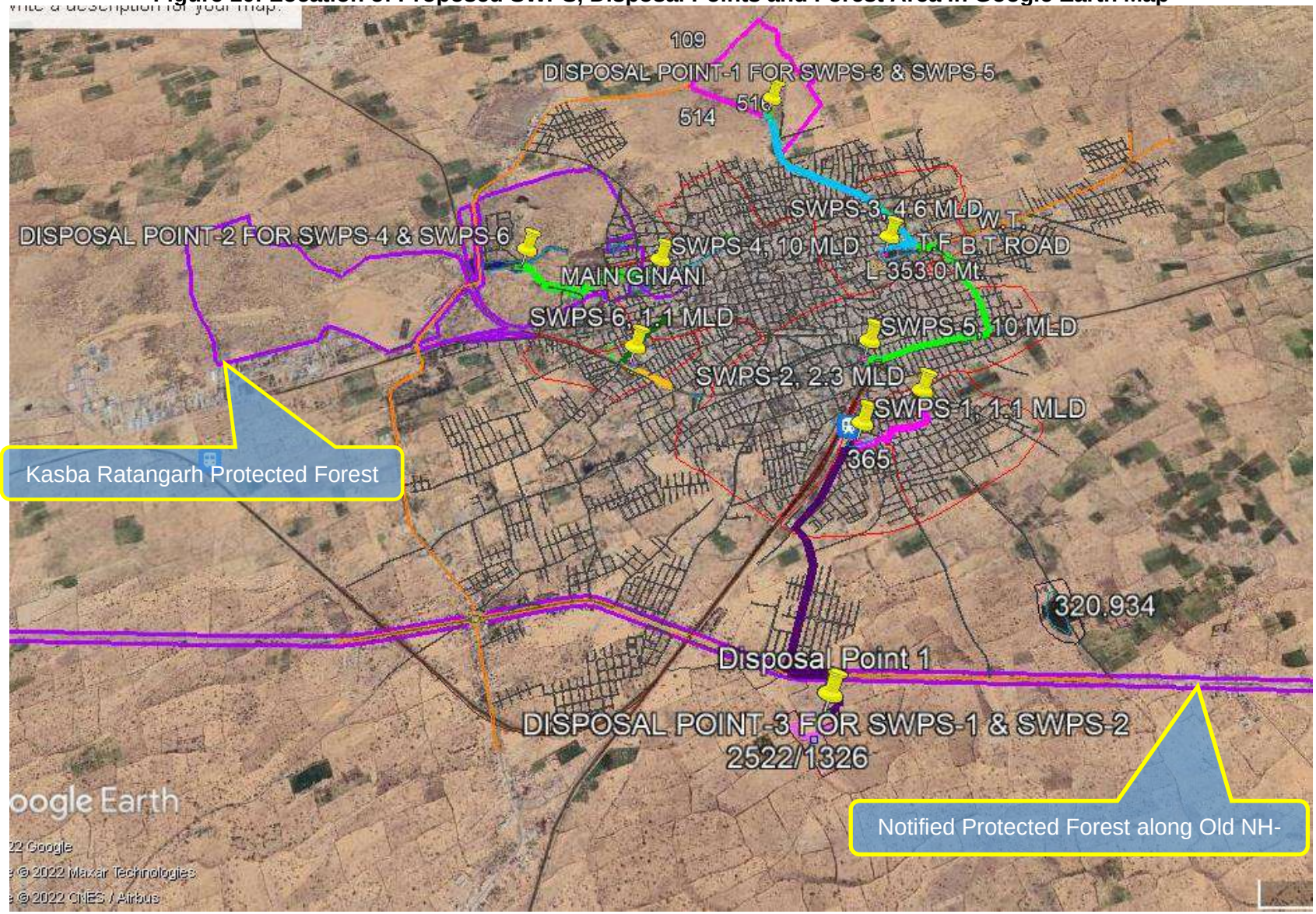


Figure 11: Proposed Component on Survey of India Toposheet

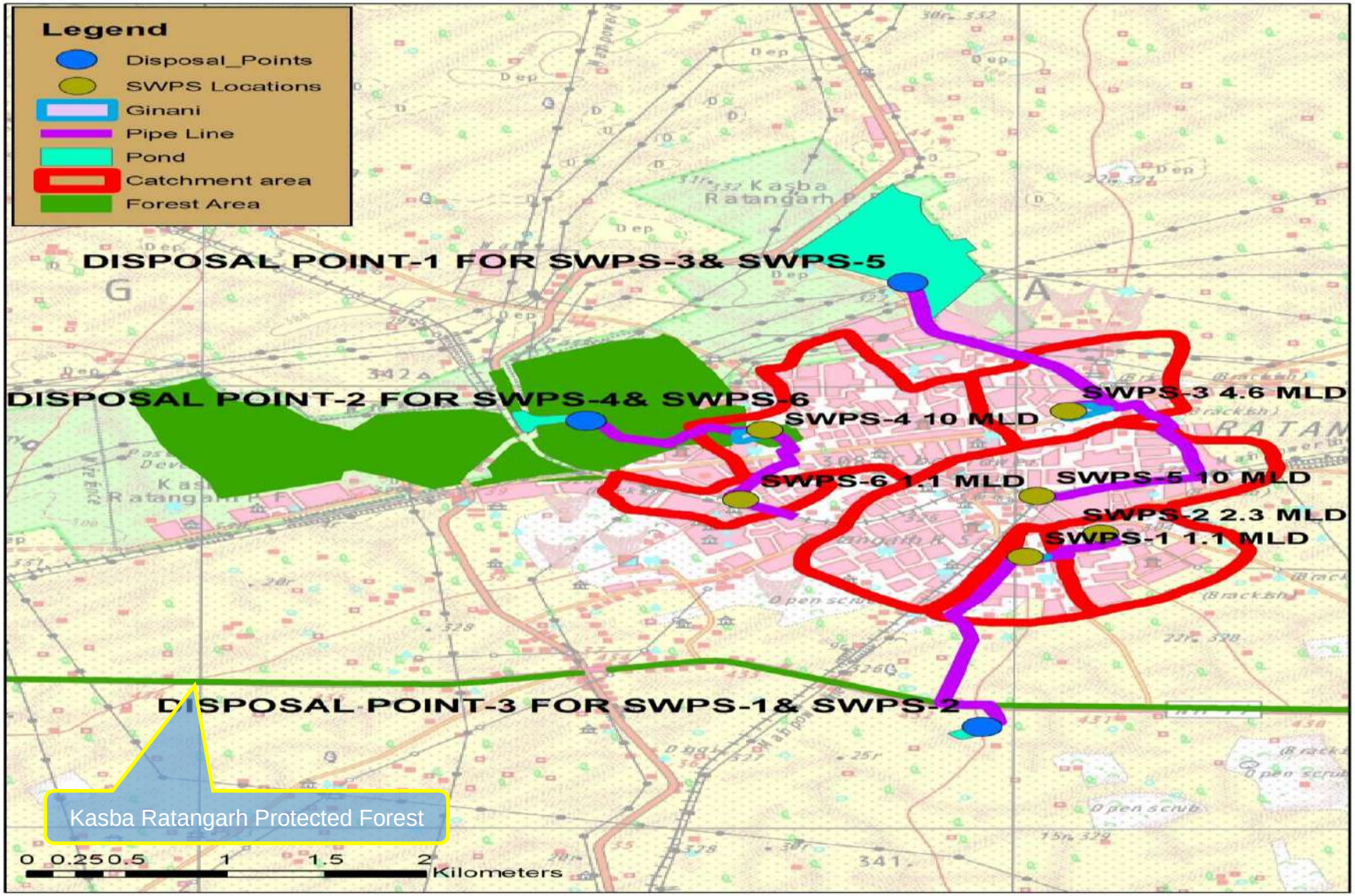


Figure 9: Layout of SWPS-1-Railway Quarter

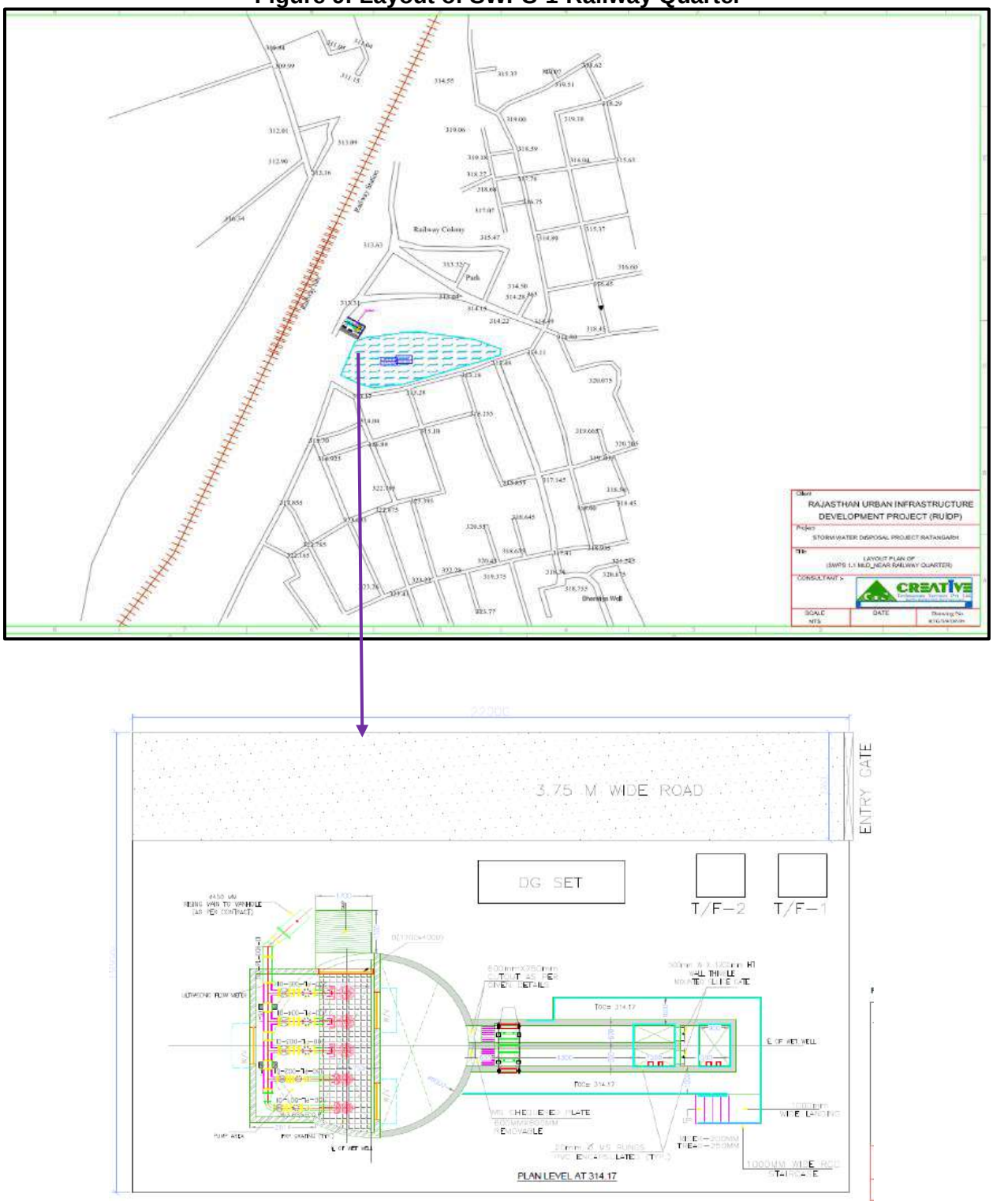


Figure 10: Location of proposed Pumping station site marked on google map-SWPS-1 near Railway Quarter

Latitude 28°04.'02.70"N **Longitude**74°37'32.57"E

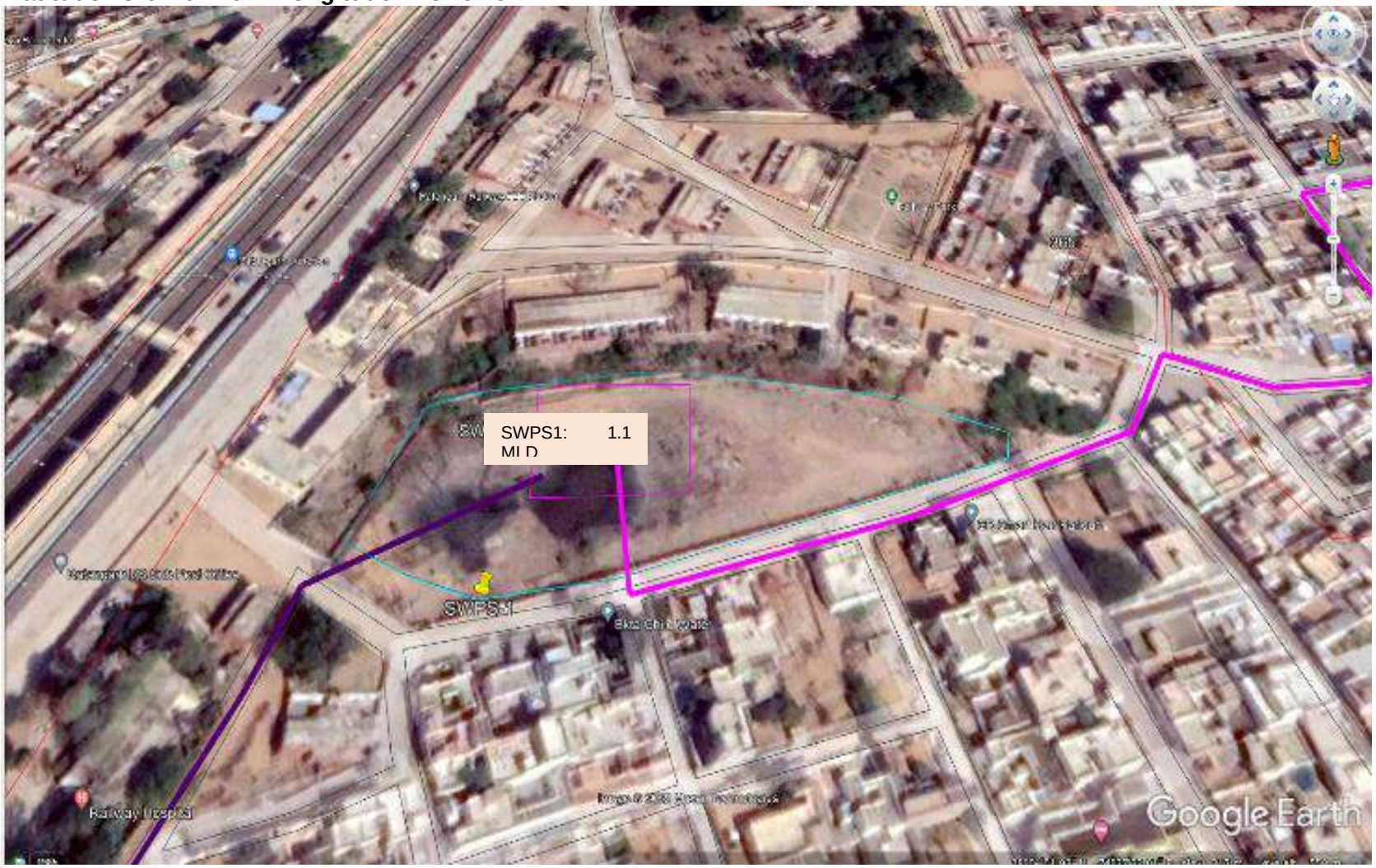


Figure 14: Location of Disposal – south of national highway-11

Latitude 28°02.'59.60"N **Longitude** 74°37'40.98"E

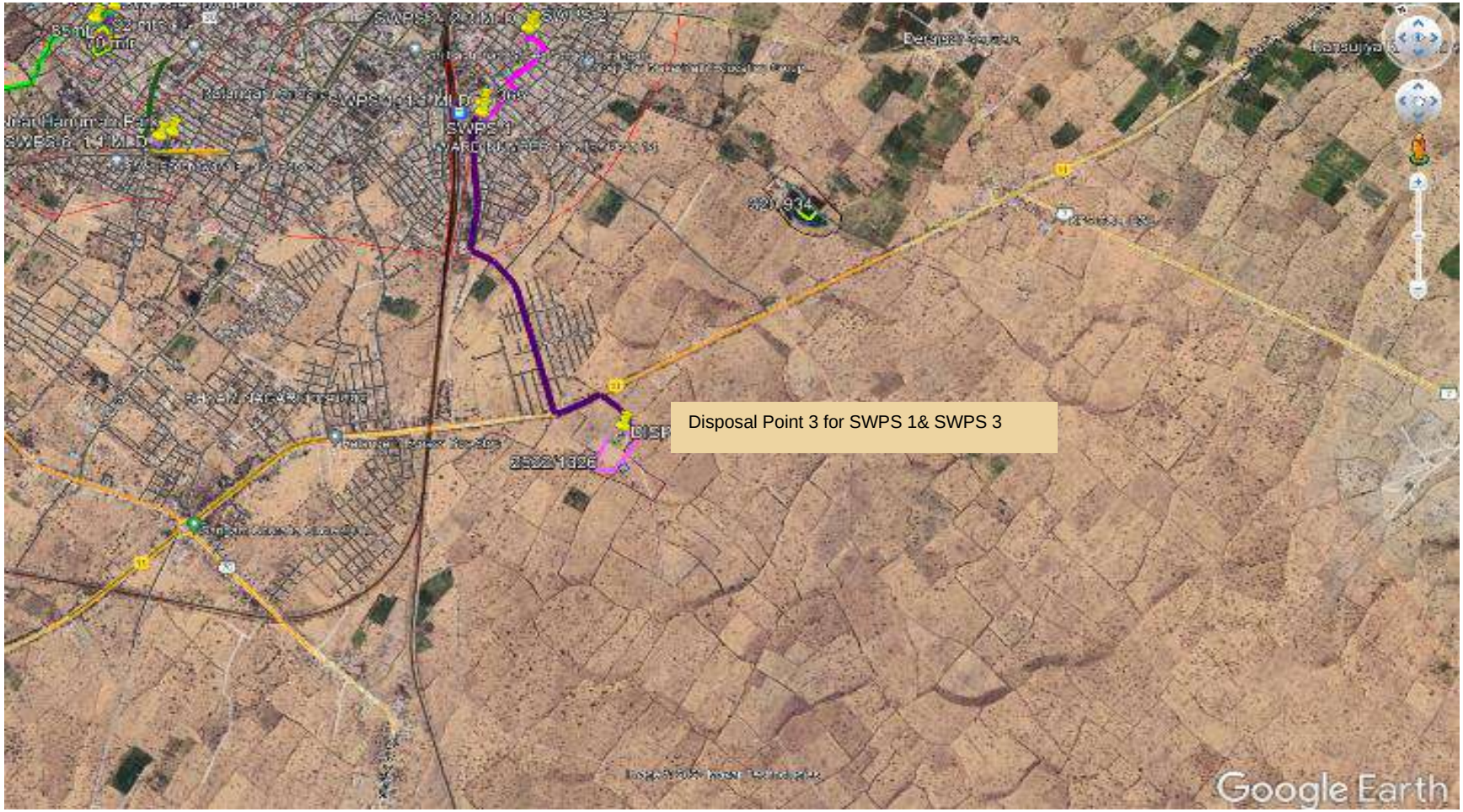
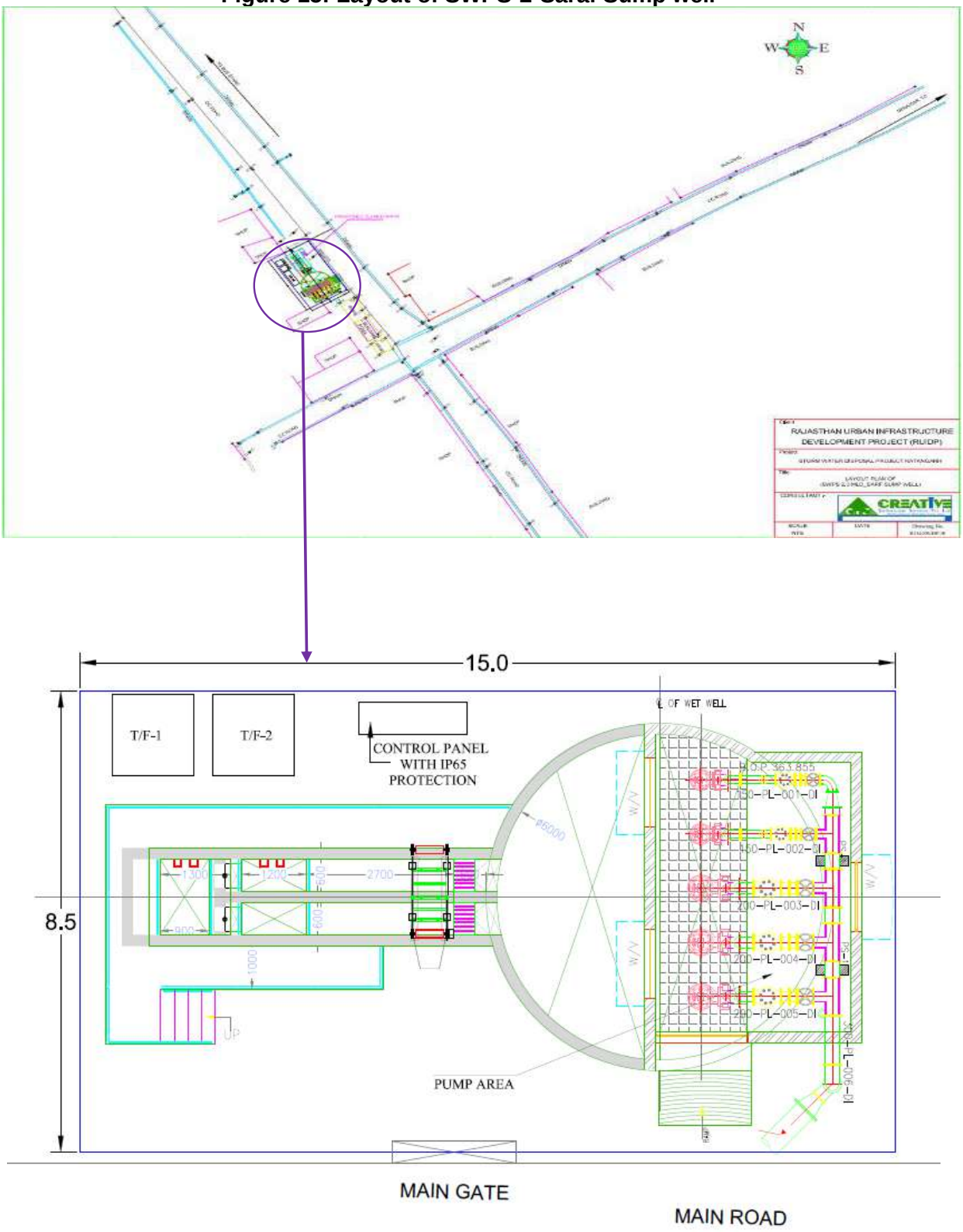


Figure 15: Layout of SWPS-2-Saraf Sump well

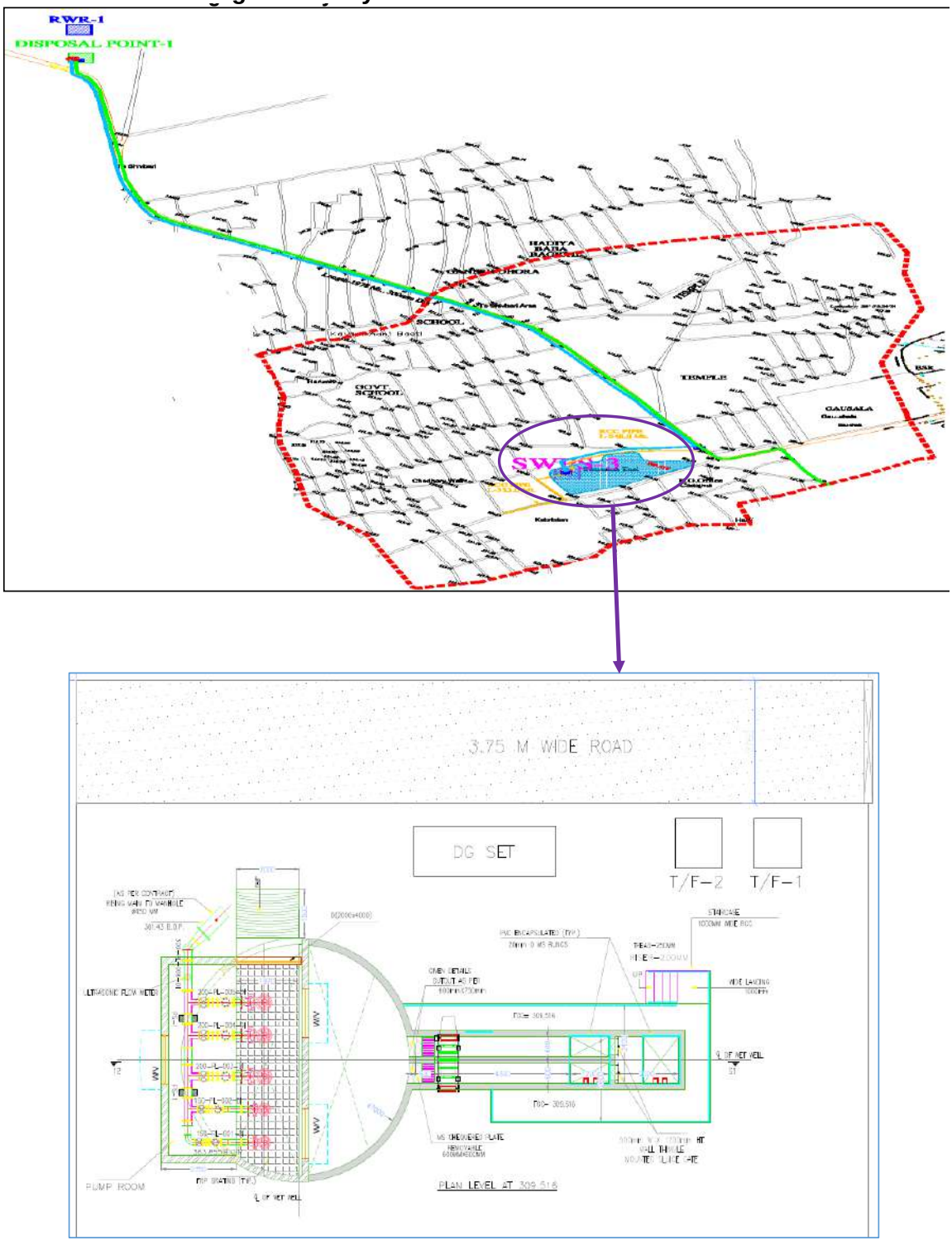


Source: Detailed Project Report-Ratangarh, 2022

Figure 16: Location of proposed Pumping station site marked on google map-SWPS-2 near Saraf Sump well

Latitude 28°04.'10.54" N **Longitude**74°37'44.18"E

Figure 17: Layout of SWPS-3- Parmana Taal



Source: Detailed Project Report-Ratangarh, 2022

Figure 18: Location of proposed Pumping station site marked on google map-SWPS-3 near Parmana Taal

Latitude 28°04.'52.27"N **Longitude**74°37'43.81"E

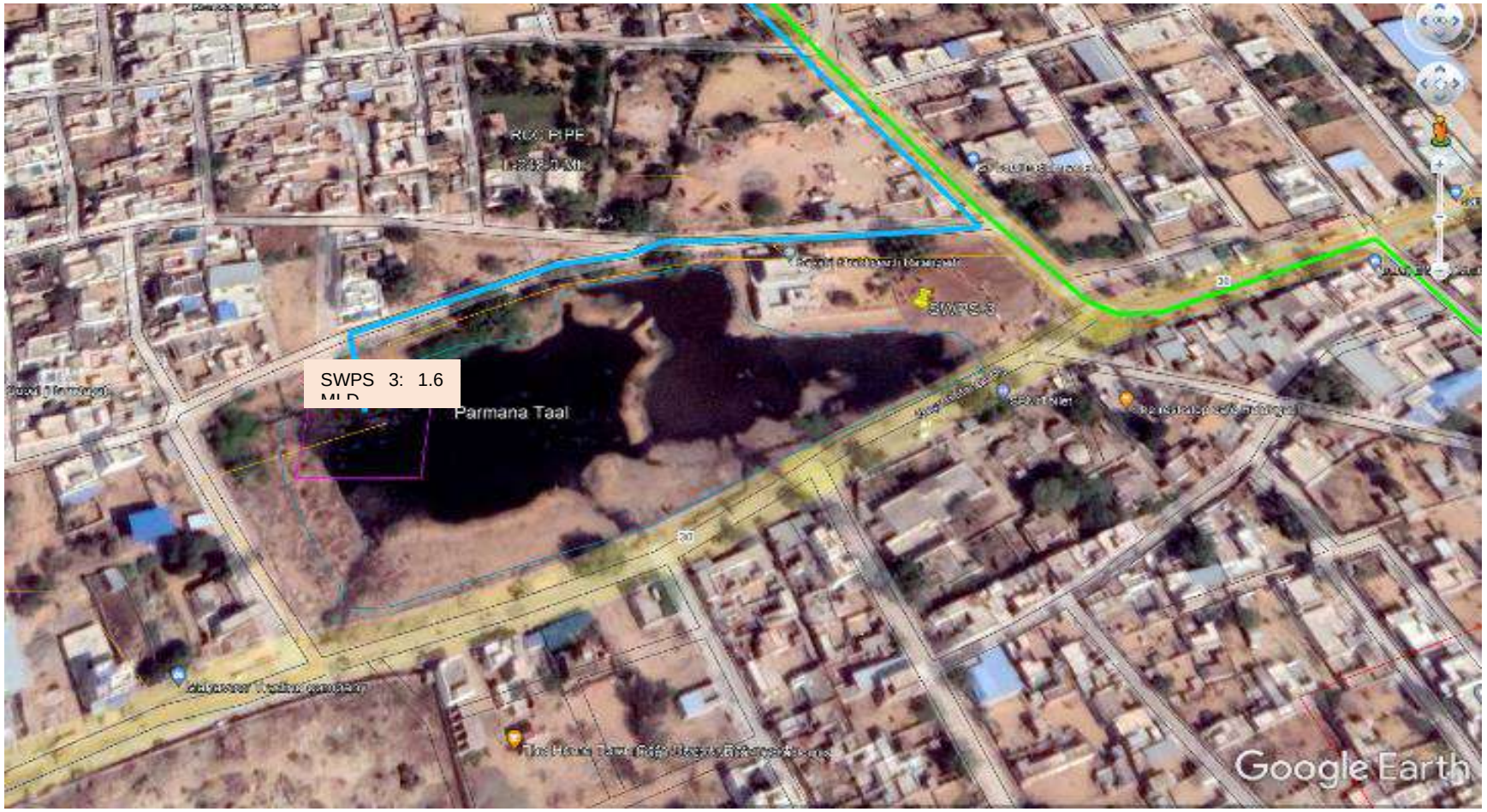


Figure 11: Location of Disposal-2-Churu-Sardarsagar bypass Road –Forest land

Latitude 28°04.'48.29"N **Longitude** 74°36'11.43"E

Figure 20: Layout of SWPS-4- Main Ginani

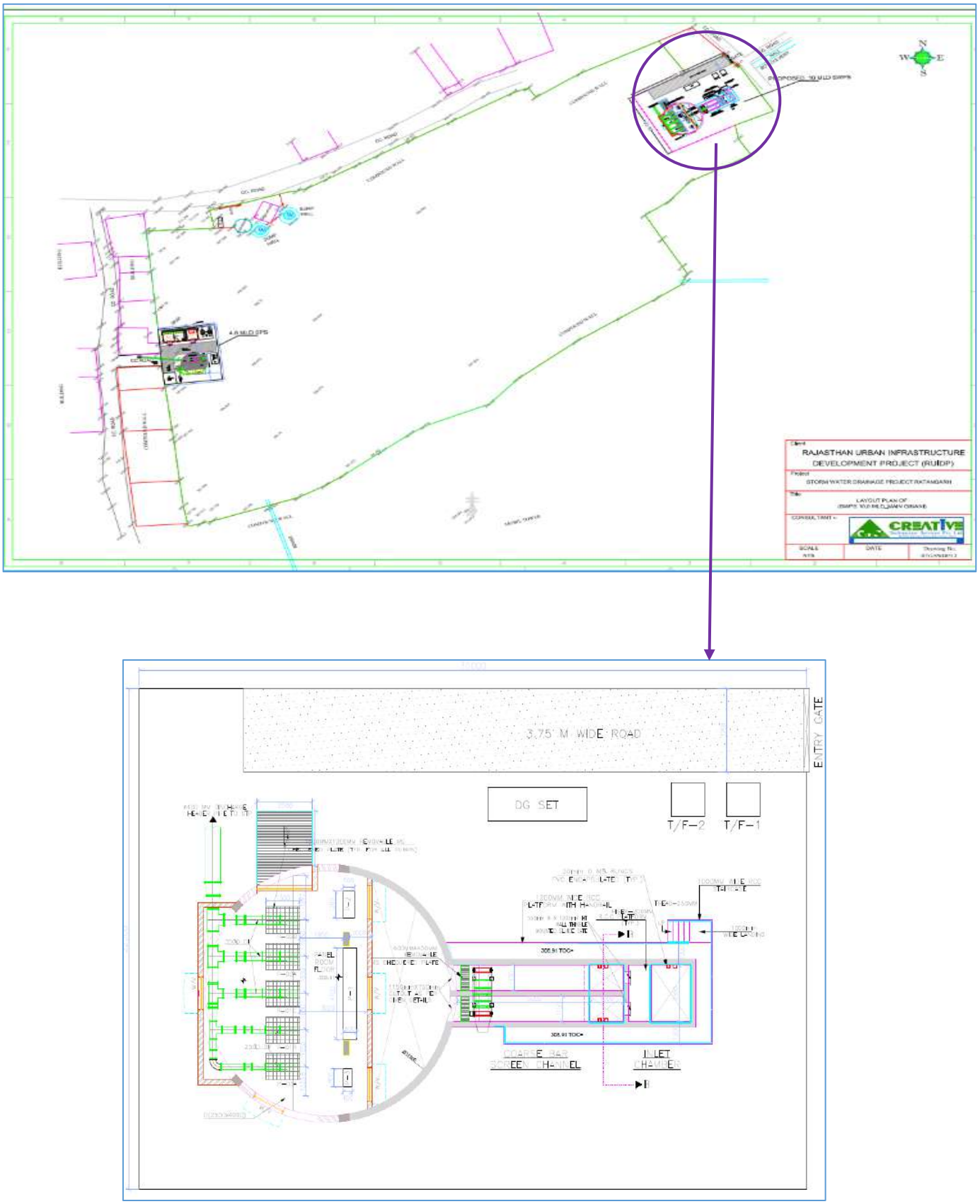


Figure 12 : Location of proposed Pumping station site marked on google map-SWPS-4 Main Genani

Latitude 28°04.'43.14"N **Longitude**74°36'40.74"E

Figure 13: Layout of SWPS-5- Near BSNL Office

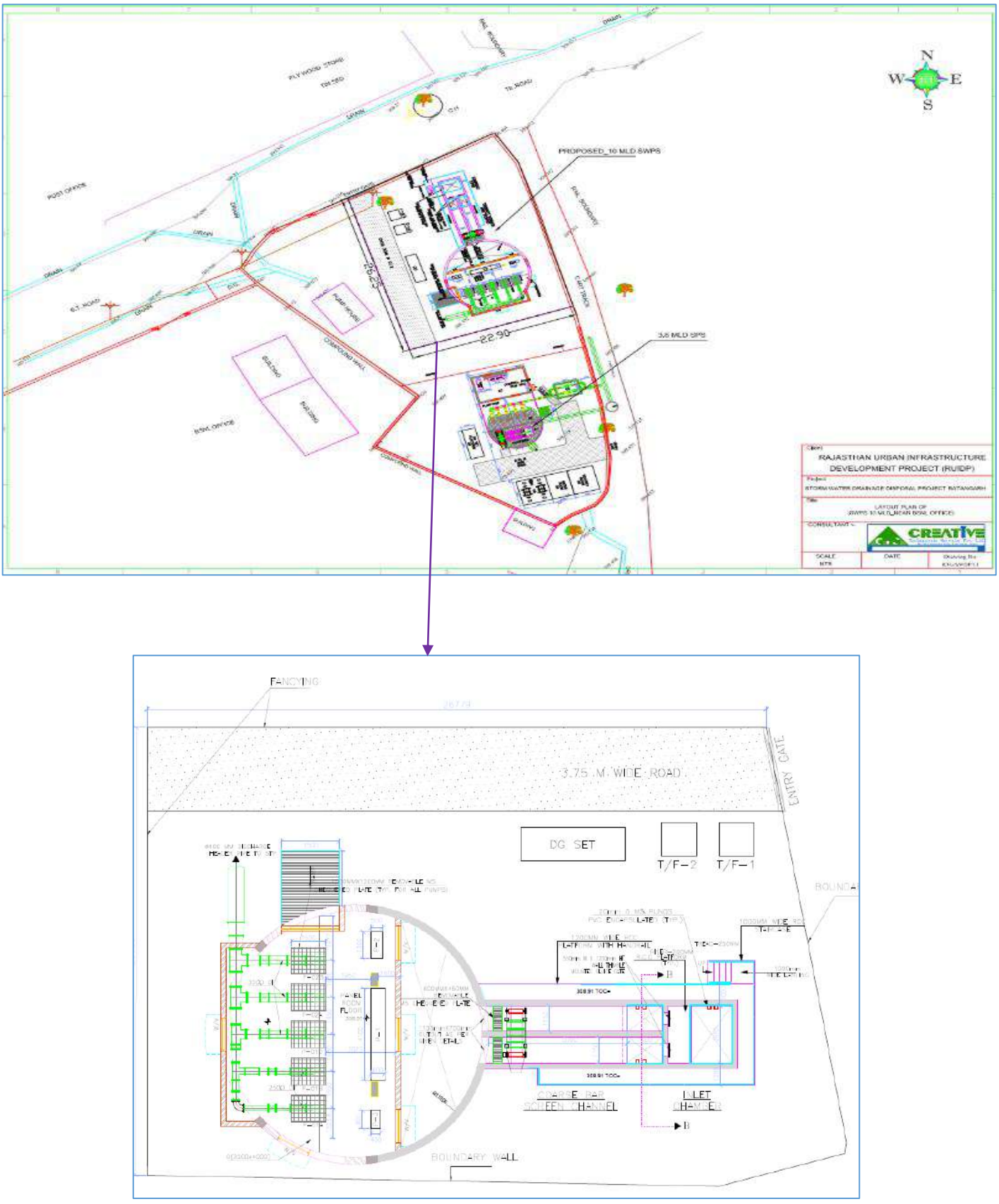


Figure 14: Location of proposed Pumping station site marked on google map-SWPS-5 Near BSNL office

Latitude 28°04.'22.00"N **Longitude**74°37'34.91"E

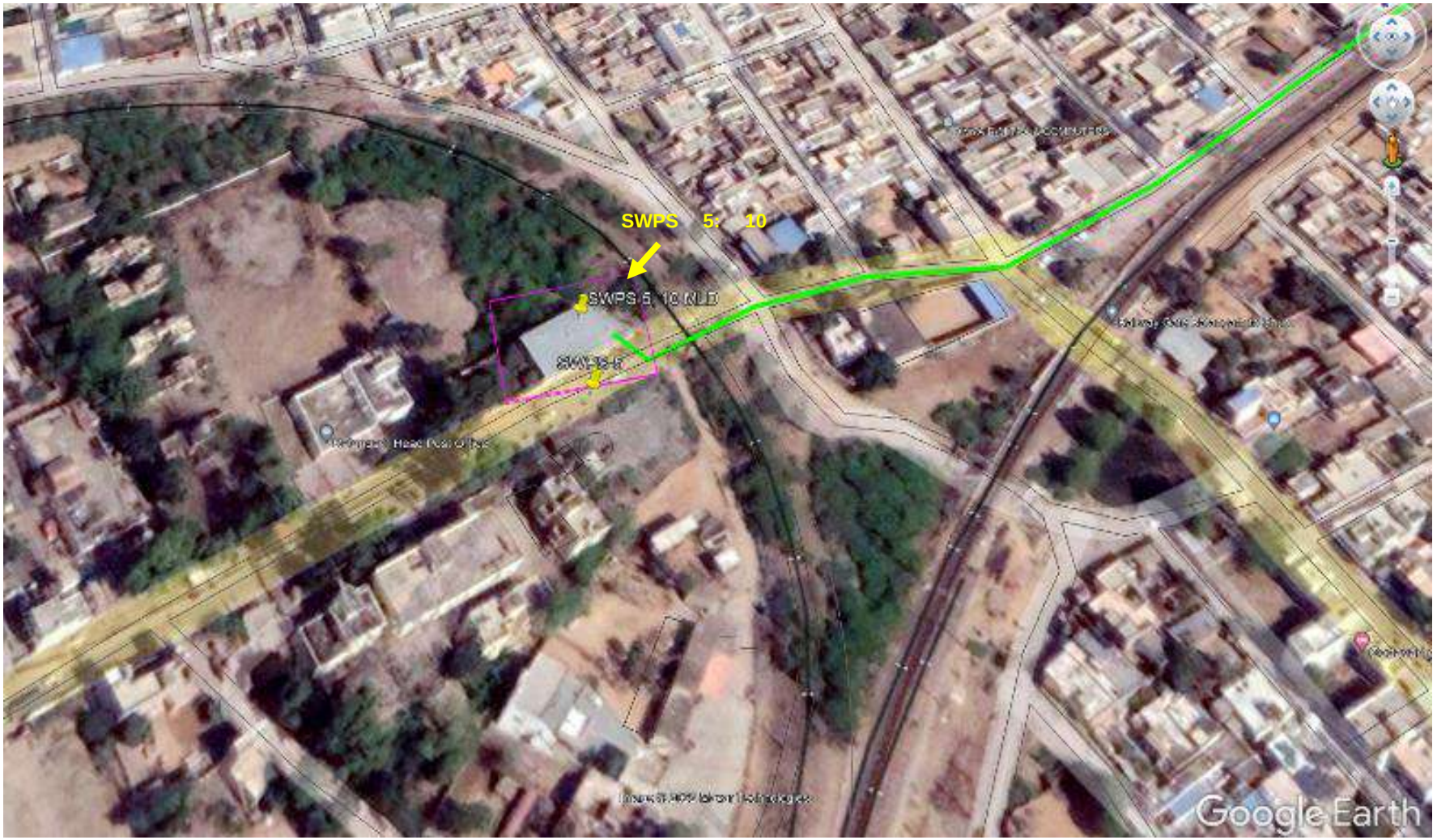


Figure 15: Location of Disposal-near mega highway Sardarshahar Gaushala land

Latitude 28°05.'31.68"N **Longitude** 74°37'10.58"E

Figure 16: Layout of SWPS-6- Near Hanuman Park

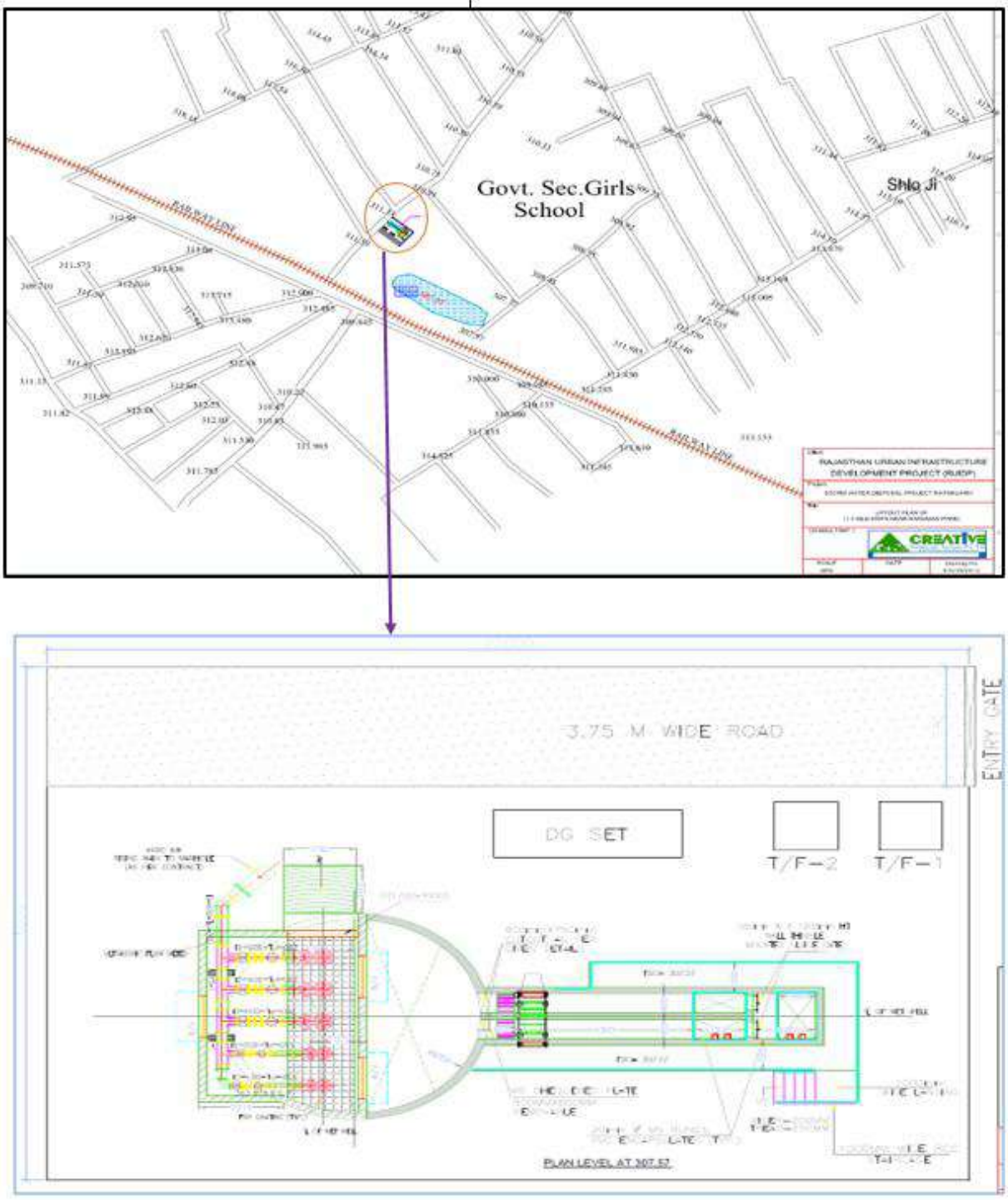
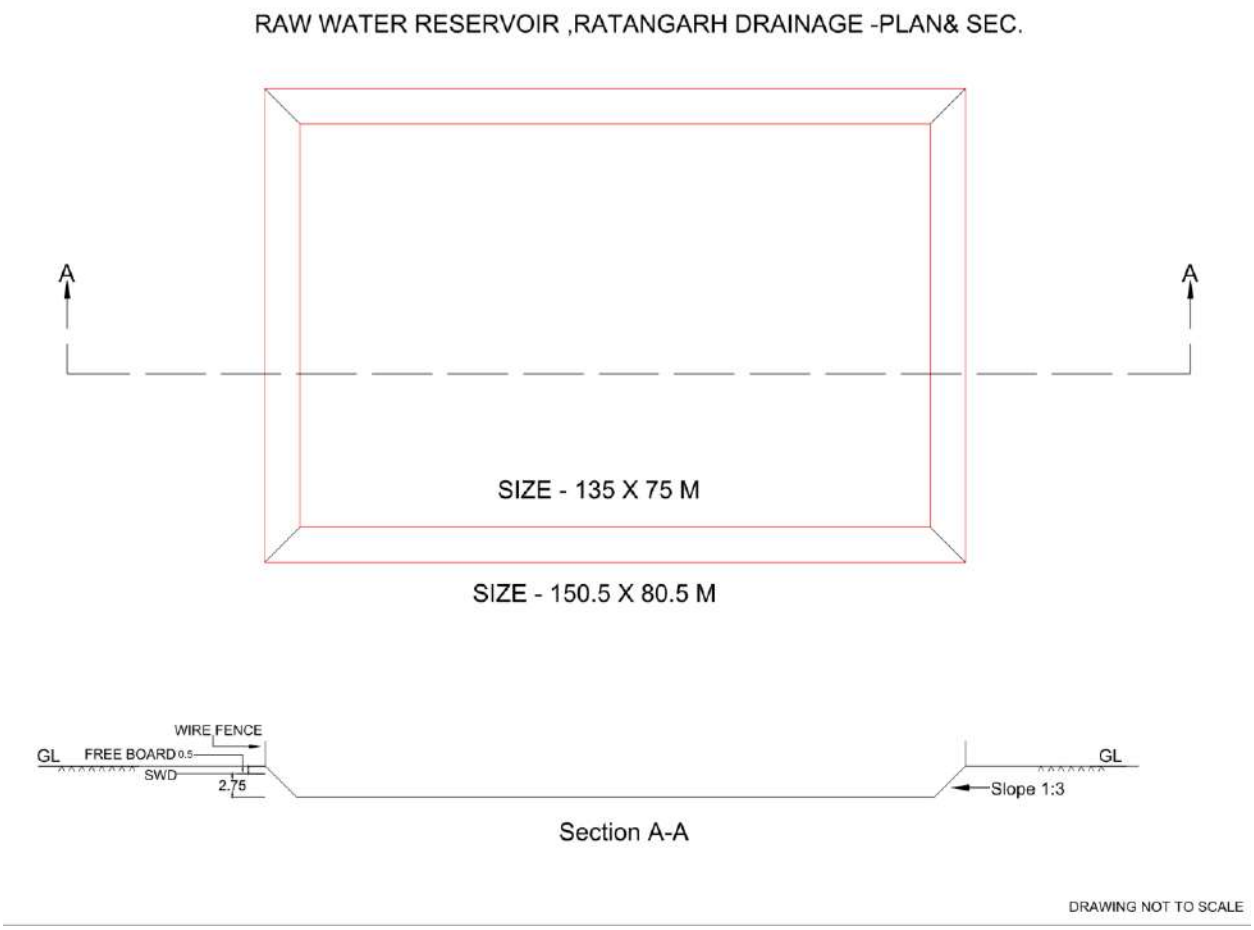


Figure 26: Location of proposed Pumping station site marked on google map-SWPS-6 Near Hanuman Park
Latitude 28°04.'22.67"N **Longitude**74°36'40.17"E

Source: Detailed Project Report-Ratangarh, 2022

Figure 27: 30 ML Raw water reservoir



III. ANALYSIS OF ALTERNATIVES

37. The ADB SPS 2009 requires an analysis of project alternatives to determine the best method of achieving project objectives (which is safely collecting and disposing the water from two major drain, in Ratangarh Town, in this case) while minimizing environmental impacts. Alternative analysis provides opportunity to integrate environmental considerations into early stages of project (i.e., pre-feasibility or feasibility study), so that adverse environmental impacts can be avoided or minimized by various alternatives. It also provides opportunity to study various options vis a vis costs, provides a logical base, via transparent process, assist in decision making, gaining public support and ultimately in project approvals and timely implementation.

38. The "with" and "without" project scenarios are analyzed with respect to the development of the state by the back-drop of requirement of reliable quality infrastructure for sustained growth economy and consequent well-being of its citizens. The proposed drainage subproject component in Ratangarh includes strengthening of major drains of Ratangarh city, for safe collection and disposal of water from these drains into various disposal points. Descriptions of various alternatives considered for proposed components are presented in the following Table 7.

Table 7: Analysis of Alternatives of SWPS.

1.	**Project Need – No Project Alternative**
Type of alternative	**'No project' / 'with project' alternative**
Description of alternatives	**<u>No project alternative</u>** Low depressed areas in Ratangarh city are submerged during heavy rainfall due to improper drainage system, leakage in underground pipelines, and blockage of road during monsoon season Water born dieses will be increased during monsoon season due to the stagnant water at low depression areas Excess problem is created near the Giannis during monsoon season due to heavy rainfall. Living conditions due to lack of proper drainage system, and sewerage, are poor, unhealthy and unhygienic. Lack of proper infrastructure is also causing environmental pollution, overall poor quality of life. Poor environmental quality affects the urban poor more. The project intends to provide following benefits to the people residing in the sub-project area, and the "no project" alternative will deprive people of these benefits: • better public health particularly reduction in waterborne and infectious diseases; • improvement in quality of water bodies due to disposal of storm water • newly constructed drainage systems will cater to not only runoff from roads but also the runoff of complete catchment area, which is causing flooding and overflow in the current scenario **With No Forest Option** As it has already been mentioned in Chapter II that one disposal location including raw water reservoir are proposed to be constructed within Forest Area of 0.15 ha. During alternative analysis, 'With No Forest' option has also been considered so

	that occupying of forest area could be avoided for the construction of these proposed components. But the technical study shows that there are no other possible options for the proposed project. This project is conceptualized as an unique system and therefore Forest areas cannot be avoided. Hence, this 'With No Forest' option seems inappropriate for the proposed project. **With project alternative** The proposed sub-projects will support the ongoing efforts of the Government of Rajasthan (the government) towards improving storm water drainage and sewerage systems. The project is expected to increase operational efficiency, improve service delivery, and result in a positive impact on health and quality of life for the residents of project towns in the state. Drainage system of Ratangarh will be improved. Water submergence problems will be controlled at Low depressed areas through improvement in storm water drainage system, replacement of old pumping system & underground pipelines, proposed new pipeline with high pumping capacity. Water born dieses will be controlled due to pumping out the stagnant storm water. Excess quantity of storm water will be pumped out through new pumping motors and pipelines. During construction period some temporary degradation of air quality due to emission from hot mix plant, stone crusher, generator and other machinery will occur. Machinery will cause noise pollution and construction spills, wastes, degraded materials will cause deterioration of soil quality and surface water. But all these have short term impacts and proper mitigation measures will be taken through EMP. Overall, the 'with project alternative' will bring about improved public health and living environment that will contribute to improved quality of life in the municipality area. Improved sanitation and drainage systems will create an enabling environment for local economic development and improved social services that communities within the sphere of influence of the municipality will benefit from, thus, contributing to the overall economic development of the region. .
Selected Alternative	Without subprojects would yield the 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/area and the defer commitments to improve the proportion of the population with sustainable access to clean environment and basic drainage and sanitation. Given the large-scale benefits to the population and environment, 'with project' alternative is considered appropriate
2	**Project Locations**
Description of alternatives	**A. Pumping Stations and disposal points** 1. **SWPS-1:** The catchment includes area around Railway Colony and area around Saith Baijnath Bhartiya Govt. Secondary School. One 1.1 MLD SWPS is proposed near railway quarters. The disposal of storm water from this SWPS is proposed in Nagar Palika Land near South of National highway-11 (Disposal point

	1). 2. **SWPS-2**: It lies in the southeast part of the town. One 2.3 MLD SWPS is proposed near Saraf Sump Well location. The disposal of storm water from this SWPS is proposed in Nagar Palika Land near South of National highway-11 (Disposal point 1). 3. **SWPS-3:** The catchment includes area around Government School, Choudhary Well, E.G. Office Campus, Temple, etc. One 4.6 MLD SWPS is proposed at Parmanan Taal location. The disposal of storm water from this SWPS is proposed in West of Main Ginani which is a Forest land (Disposal Point-3) 4. **SWPS-4**: It holds the largest amount of water. The catchment includes area around Ramchand Park, Mochi Well, Central Academy, etc. One 10 MLD SWPS is proposed at main Ginani location. The disposal of storm water from this SWPS is proposed in Forest Land, West of Main Ginani (Disposal Point-3). Disposal point in the forest is being using already as disposal point where storm water is naturally stored by gravity and there are no significant vegetation except *Acacia juliflora*, Therefore this disposal location will be continue in the proposed subproject. 5. **SWPS-5**: The catchment includes area around BSNL Office, Goga Mandi, Post Office, etc. One 10 MLD SWPS is proposed at this location. The disposal of storm water from this SWPS is proposed near Mega highway Sardarshahar (Disposal Point-2) 6. **SWPS-6:** The catchment of this area includes Mandawa Road, back side of Pinjarapole, Old Railway Puliya, etc. One 1.1 MLD SWPS is proposed Near hanuman Park location. The disposal of storm water from this SWPS is proposed in the existing drain size of 900mm x 1500mm near Seth Nagar Mal Bajoriya Secondary School. 3 nos. of earthen Raw Water Reservoirs are proposed at the disposal locations for utilization and preventing overflowing of storm water. **B. Rising Main/Gravity Main** • A rising main 10.12 km of dia (150 and 400 mm) and gravity main of 0.96 km of dia 600 mm is proposed in the centre of the road which is owned by Nagar Palika, Ratangarh for disposal of storm water from SWPS to Disposal point. Proposed alignment will pass through unused /vacant/barren public lands /road ROW of Nagar Palika, Ratangarh. Transect walk conducted along the proposed rising main alignment has confirmed that no commercial establishment - permanent shops or mobile vendors exist along the route and no economic impact is anticipated. • Rising Main Pipe Line from SWPS-3 (Parmana Taal) to and SWPS 4 (Main Ginani) to Disposal Point 3 at Forest land will cross NH-52 and Disposal Point No.3 falls in the forest land (in Kasaba Ratangarh Forest Block) and approx. 0.15 ha forest will required for these components, Therefore diversion is required and it will be taken from MOEF&CC Regional Office Jaipur. • No of Asbestos Cement Material (ACM) is proposed to be used in the subproject construction There are existing asbestos cement pipes of 5401m underground in the existing rising mains of drainage networks. The sub-project,

	however, do not include rehabilitation or repair of AC pipes, and the project, in fact, designed to discontinue the use of AC pipes. • Construction of gravity mains to channelize flow to SWPS inlet at Main Ginani and near Hanuman Park SWPS are proposed • There are no eco-sensitive or protected areas within or close to proposed project activity areas. No wildlife is also reported in the project town. During drainage networks pipe laying works tree cutting is not envisaged as per preliminary design. Therefore, proposed infrastructures and pipeline alignments are selected based on available ROW and govt. lands, and no project alternative selected.

IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORKS

A. ADB Safeguard Policy

39. ADB SPS Requires that during the design, construction, and operation of the project necessary compliance to all applicable laws and international conventions / treaties along with pollution prevention and control technologies and practices consistent with international good practice, are ensured.

40. ADB uses a classification system to reflect the significance of a project's potential environmental impacts. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. Each proposed project is scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. Projects are assigned to one of the following four categories:

(i) Category A. A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An Environmental Impact Assessment (EIA) is required.
(ii) Category B. A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination (IEE) is required.
(iii) Category C. A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
(iv) Category FI. A proposed project is classified as category FI if it involves investment of ADB funds to or through a FI.

41. **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.

42. **Public Disclosure.** The IEE will be put in an accessible place (e.g., local government offices, libraries, community centers, etc.), and a summary translated into local language for the project affected people and other stakeholders. The following safeguard documents will be put up in ADB's website so that the affected people, other stakeholders, and the public can provide meaningful inputs into the project design and implementation:

(i) For environmental category A projects, a 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 PMU during project implementation upon receipt.

43. **Consultation and Participation.** ADB SPS, 2009 require borrower to conduct meaningful consultation[2] with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. The consultation process and its results are to be documented and reflected in the environmental assessment report.

44. **Grievance Redress Mechanism.** ADB SPS, 2009 require 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 mechanism shall be scaled to the risks and adverse impacts of the subproject.

45. **Monitoring and Reporting.** 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 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.

46. **Unanticipated Environmental Impacts.** Where unanticipated environmental impacts become apparent during subproject implementation, ADB SPS, 2009 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.

47. **Occupational Health and Safety.** ADB SPS, 2009 requires the borrower[3] to ensure that workers[4] are provided with a safe and healthy working environment, taking into account risks

[2] Per ADB SPS, 2009, meaningful consultation means a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle 1; (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.

[3] 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.

[4] 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.

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.

48. **Community Health and Safety.** ADB SPS, 2009 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.

49. **Physical Cultural Resources.** Borrower is responsible for siting and designing the subproject to avoid significant damage to physical cultural resources. ADB SPS, 2009 requires 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 shall be included in the EMP.

50. **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[5] and Sector Specific [Water and Sanitation] Guidelines[6]). 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 Laws

51. The implementation of the subprojects will be governed by Government of India and State of Rajasthan and other applicable environmental acts, rules, regulations, and standards. These regulations impose restrictions on the activities to minimize or mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure

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

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

subprojects are consistent with the legal framework, whether applicable international, national, state or municipal or local. Key standards include those related to drinking water quality, air quality, effluent discharge, and protected areas. Compliance is required in all stages of the subprojects including design, construction, and operation and maintenance.

52. **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.

53. **Category A** projects require environmental clearance from the central Ministry of Environment, Forests and Climate Change (MOEFCC). The proponent is required to provide preliminary details of the project in the prescribed manner with all requisite details, after which an Expert Appraisal Committee (EAC) of the MOEFCC prepares comprehensive terms of reference (TOR) for the EIA study. On completion of the study and review of the report by the EAC, MOEFCC considers the recommendation of the EAC and provides the environmental clearance if appropriate.

54. **Category B** projects require environmental clearance from the State Environment Impact Assessment Authority (SEIAA). The State level EAC categorizes the project as either B1 (requiring EIA study) or B2 (no EIA study) and prepares TOR for B1 projects within 60 days. On completion of the study and review of the report by the EAC, the SEIAA issues the environmental clearance based on the EAC recommendation. The Notification also provides that any project or activity classified as category B will be treated as category A, if it is located in whole or in part within 10 km from the boundary of protected areas, notified areas or inter-state or international boundaries.

55. None of the components of this Drainage subproject falls under the ambit of the EIA Notification 2006, and therefore EIA Study or environmental clearance is not required for the subproject.

56. **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 8.**

C. Environmental Regulatory Compliance

57. **Table 8** presents a summary of environmental regulations and mandatory requirements applicable to Ratangarh Drainage subproject.

Table 8: Applicable Environmental Regulations

Law	Description	Requirement	Relevance to Project Phase
National Environment Policy (NEP), 2006.	NEP is a comprehensive guiding document in India for all environmental conservation programs	RSTDSP should adhere to NEP principle of “enhancing and conservation of environmental resources and abatement of pollution”.	All phases of project

Law	Description	Requirement	Relevance to Project Phase
	and legislations by Central, State and Local Government. The dominant theme of this policy is to promote betterment of livelihoods without compromising or degrading the environmental resources. The policy also advocates collaboration method of different stakeholders to harness potential resources and strengthen environmental management.		
Rajasthan State Environment Policy, 2010 And Rajasthan Environment Mission and Climate Change Agenda for Rajasthan (2010-14)	Follows the National Environment Policy, 2006 and core objectives and policies are: -Conserve and enhance environmental resources; assure environmental sustainability of key economic sectors; and, improve environmental governance and capacity building - it recommends specific strategies and actions to address the key environmental issues: water resources, desertification and land degradation, forest and biodiversity, air quality, climate change: adoption and mitigation, mining, industry, tourism, energy, urban development, etc. - Establishment of Environment Mission	Project implementation should adhere to the policy aims of: conservation and enhancement of environmental resources, integration of environmental concerns into projects/plans, and capacity building in environmental management. Under water sector, major concerns, as the policy notes, are huge water losses and wastage, declining water availability, pollution. Relevant recommendations for the project include control of losses, integrated water resources management, control of raw water pollution, reuse and recycling. Avoid/minimize use of forest lands. With reference to climate change adoption and mitigation following should be considered in the project: (i) diminishing flows in surface water bodies, and groundwater depletion, and revival traditional water bodies as water sources (lakes/tanks); (ii) equal stress on demand side management in water; and (iii)	All phases of project

Law	Description	Requirement	Relevance to Project Phase
	under the chairpersonship of the Chief Minister and a Steering Committee under the chairpersonship of Chief Secretary, Government of Rajasthan Tasks force set up for six key areas	minimize energy use - design energy efficiency systems.	
EIA Notification,2006	Projects indicated in the schedule of this notification require EIA study and environmental clearance.	None of the components of this subproject falls under the ambit of the notification; no EIA study or environmental clearance required	Not applicable
Central Ground Water Authority (CGWA) Public Notice 2/100	Public Notice specifies districts and areas where there are restrictions on the construction and installation of any new structure for extraction of groundwater resources without specific approval from the CGWA	No new ground water well are proposed in subproject	Not applicable
Central Ground Water Authority under Department Of Water Resources, River Development And Ganga Rejuvenation- Gazette Notification dtd. 24.09.2020	extraction of ground water for drinking & Domestic use for Residential apartments/ Group Housing Societies/ Government water supply agencies in urban areas need to take NOC from Central Ground Water Authority (CGWA)	For grant of No Objection Certificate for ground water extraction, the project proponent has to furnish the details as per the guidelines issued by the CGWA in proper format as available in CGWA website (https://cgwa-noc.gov.in/LandingPage/index.htm). No new ground water well are proposed in subproject	Pre-construction/ construction and operation
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	Proposed project components does not require consent under this Act	Not applicable

Law	Description	Requirement	Relevance to Project Phase
	assigning to CPCB/SPCBs powers and functions relating to water pollution control. Control of water pollution is achieved through administering conditions imposed in consent issued under provision of the Water (Prevention and Control of Pollution) Act of 1974. These conditions regulate the quantity and quantity of effluent, the location of discharge and the frequency of monitoring of effluents. Any component of the subproject having the potential to generate sewage or trade effluent will come under its purview. Such projects have to obtain Consent to establish (CTE) under Section 25 of the Act from Rajasthan State Pollution Control Board (RSPCB) before starting implementation and Consent to Operate (CTO) before commissioning.		
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	This Act was enacted to achieve prevention, control and abatement of air pollution activities by assigning regulatory powers to Central and State boards for all such functions. The Act also establishes ambient air quality standards. The projects having potential to emit air pollutants into the atmosphere have to obtain CTE and CTO under Section 21 of the	The following will require CTE and CTO from RSPCB: (i) Diesel generators (more than 15 KVA); (ii) Batching Plant hot mix plants; and (iii) stone crushers, if installed for construction. All relevant forms, prescribed fees and procedures to obtain the CTE and CTO can be found in the RSPCB website (http://environment.rajasthan.gov.in) If ready mix concrete and hot mix bitumen is procured from third party, contractor has to ensure that the	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	Act from RSPCB. The occupier of the project/facility has the responsibility to adopt necessary air pollution control measures for abating air pollution.	plants, from where material is being purchased is having CTE/CTO and copy should be collected from third party and submitted in PIU	
Biodiversity Act of 2002	This Act 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	-
Wildlife Protection Act, 1972 and 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.	There is no protected areas within the 10 km radius, Therefore this act is not applicable.	Not Applicable
Forest (Conservation) Act, 1980	The Forest (Conservation) Act prohibits the use of forest land for non-forest purposes without the approval of Ministry of Environment Forests & Climate Change (MoEFCC), Government of India	Applicable ; Rising Main pipeline from (A) SWPS-4 to Disposal Point 2 in Kasaba Ratangarh Forest Block, (B) Disposal of storm water from SWPS-4 in Kasaba Ratangarh protected forest area and (C) NH crossing of rising main pipeline (from SWPS-1&2 to Disposal point 3 though Notified Protected Forest existed on both side of NH-52 (old No. NH-11).	Applicable
Environmental (Protection) Act, 1986 amended in 1991 and the following rules/notifications:	This is an “umbrella” legislation that empowers the Central Government to take all necessary measures to protect and improve the quality of the	There are rules / notifications that have been brought out under this Act, which are relevant to RSTDSP, and are listed below	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	environment and prevent, control and abate environmental pollution. Empowers central government to enact various rules to regulate environmental pollution, including standards for quality of air, water, noise, soil; discharge standards or allowable concentration limits for environmental pollutants, handling of hazardous substances, locating/prohibiting industries, etc.,		
Environmental Standards (ambient and discharge).	Emissions and discharges from the facilities to be created or refurbished or augmented shall comply with the notified standards	**Appendix C-2** provides ambient air quality standards, **Appendix C-3** provides emission limits for vehicle exhaust and **Appendix C-5** provides emission limits of DG sets and **Appendix C-4** provided emission stack height requirements for diesel generators	Construction and operation
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.	**Appendix C-7** provides applicable noise standards	Construction and operation
Solid Waste Management Rules 2016	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; store separately construction and demolition waste, as and when generated, in	Contractor to follow all the rules during construction works	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	his own premises and shall dispose off as per the Construction and Demolition Waste Management Rules, 2016; (iii) No waste generator shall throw, burn or burry the solid waste generated by him, on streets, open public spaces outside his premises or in the drain or water bodies.		
Construction and Demolition Waste Management Rules 2016	(i) Every waste generator shall segregate construction and demolition waste and deposit at collection centre or handover it to the authorized processing facilities (ii) Shall ensure that there is no littering or deposition so as to prevent obstruction to the traffic or the public or drains (iii) Large generators (who generate more than 20 tons or more in one day or 300 tons per project in a month) shall submit waste management plan and get appropriate approvals from the local authority before starting construction or demolition or remodeling work, (iv) Large generators shall have environment management plan to address the likely environmental issues from construction, demolition, storage, transportation process and disposal / reuse of C & D Waste.	Disposal site shall be identified and allotted by Ratangarh Nagar Palika after mobilization of contractor (during SIP period). Contractor to follow all the rules during construction works. Sludge or any material if classified as hazardous waste / material is to be handled and disposed according to this Rules	Construction

Law	Description	Requirement	Relevance to Project Phase
	(v) Large generators shall segregate the waste into four streams such as concrete, soil, steel, wood and plastics, bricks and mortar, (vi) Large generators shall pay relevant charges for collection, transportation, processing and disposal as notified by the concerned authorities;		
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016,	Responsibilities of the occupier for management of hazardous and other wastes.- (1) For the management of hazardous and other wastes, an occupier shall follow the following steps, namely:- (a) prevention; (b) minimization; (c) reuse, (d) recycling; (e) recovery, utilization including co-processing; (f) safe disposal. (2) The occupier shall be responsible for safe and environmentally sound management of hazardous and other wastes. (3) The hazardous and other wastes generated in the establishment of an occupier shall be sent or sold to an authorized actual user or shall be disposed of in an authorized disposal facility. (4) The hazardous and other wastes shall be transported from an occupier's establishment to an	Contractor to comply all the requirements of this Act during construction works. No AC pipes are proposed. There are asbestos cement (AC) pipes in the existing drainage system. These will be pipes will be left as it is and not replaced..	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	authorized actual user or to an authorized disposal facility in accordance with the provisions of these rules. (5) The occupier who intends to get its hazardous and other wastes treated and disposed of by the operator of a treatment, storage and disposal facility shall give to the operator of that facility, such specific information as may be needed for safe storage and disposal. (6) The occupier shall take all the steps while managing hazardous and other wastes to- 6 (a) contain contaminants and prevent accidents and limit their consequences on human beings and the environment; and (b) provide persons working in the site with appropriate training, equipment and the information necessary to ensure their safety.		
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 in or near to designated wetland area.	Not applicable

Law	Description	Requirement	Relevance to Project Phase
Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010.	The Act designates areas within 100 meters (m) of the "protected monument/area" as "prohibited area" and beyond that up to 200 m as "regulated area" respectively. No "construction" is permitted in the "prohibited area" and any construction activity in the "regulated area" requires prior permission of the Archaeological Survey of India (ASI).	There is no ASI Protected Monuments falls under impact area of any of the component of this project.	Not applicable
The Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961; the Rajasthan Monuments, Archaeological Sites and Antiquities (amendment) Act 2007	Any construction/excavation work in the 'protected area' (as declared by GoR under the Act) requires prior permission of Department of Archaeology & Museums -Application under the Rules shall be submitted to Director, State Archaeological Department, at least 3 months prior to the work. Department provides conditional permission, including time for completion, procedures to be followed during the work and for chance finds et–.	None of project components falls within the protected areas of any of the state protected monuments.	Not applicable
The Building and Other Construction Workers (BOCW) Act 1996 and Rajasthan Building and Construction Workers Rules 2009	**Employer shall-** • Provide and maintain, at suitable point, sufficient quantity of wholesome drinking water, such point shall be at least 6 meters away from any washing areas, urinals or toilets • Provide	Contractors are required to follow all the provisions of BOCW Act and Rajasthan BOCW Rules. Salient features of Rajasthan BOCW Rules are- Chapter III, section 17- Registration of establishments Chapter VIII, section 61- Hours of works, intervals or rest and spread over, overtime Section 62- weekly rest Section 63- night shift Section 67- registers of workers	Construction

Law	Description	Requirement	Relevance to Project Phase
	sufficient urinals and latrines at convenient place, easily accessible by workers • Provide free of charge, temporary living accommodations near to work sites with separate cooking place, bathing and lavatory facilities and restore the site as preconditions after completing the construction works • Provide crèche with proper accommodation, ventilation, lighting, cleanliness and sanitation if more than fifty female workers are engaged • Provide first aid facilities in all construction sites **For safety of workers employer shall provide-** • Safe access to site and workplace • Safety in demolition works • Safety in use of explosives • Safety in operation of transporting equipment and appoint competent person to drive or operate such vehicles and equipment • Safety in lifting appliance, hoist and lifting gears	Section 68- Muster roll, wages register Section 70- latrine and urinal facilities Chapter XI- Safety and Health Section 78- fire protection Section 79- emergency action plan Section 80- fencing of motors Section 81- lifting and carrying of weight Section 82- H&S policy Section 83- dangerous and harmful environment Section 84- Overhead protection Section 88- eye protection Section 89- PPEs Section 90- electrical hazards Section 97- use of safety helmets and shoes Chapter XIII-lifting appliances and gears Chapter XV- transport and earth moving equipment Chapter XVI- concrete works Chapter XVII- demolition works Chapter XVIII-Excavation and tunneling Chapter XX- ladders and step ladders Chapter XXII- structural frame and formworks Chapter XXIV- medical facilities and first aid box	

Law	Description	Requirement	Relevance to Project Phase
	• Adequate and suitable lighting to every workplace and approach • Prevention of inhalation of dust, smoke, fumes, gases during construction works and provide adequate ventilation in workplace and confined space • Safety in material handling and stacking/un stacking • Safeguarding the machinery with fly-wheel of moving parts • Safe handling and use of plants operated by compressed air • Fire safety • Limit of weight to be lifted by workers individually • Safety in electric wires, apparatus, tools and equipment • Provide safety net, safety sheet, safety belts while working at height (more than 1.6 mtrs as per OSHA) • Providing scaffolding, ladders and stairs, lifting appliances, chains and accessories where required • Safety in pile works, concrete works, hot asphalt, tar, insulation, demolition		

Law	Description	Requirement	Relevance to Project Phase
	works, excavation, underground construction and handling materials • Provide and maintain medical facilities for workers • Any other matters for the safety and health of workers		
Contract Labor (Regulation and Abolition) Act, 1970; The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	Provides for 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. 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.,	• Applicable to all construction works in the project • Principle employer (RUDSICO-EAP) to obtain Certificate of Registration from Department of I, as principle employer • Contractor to obtain license from designated labor officer • Contractor shall register with Labor Department, if Inter-state migrant workmen are engaged • Adequate and appropriate amenities and facilities shall be provided to workers including housing, medical aid, traveling expenses from home and back, etc., **Appendix C-12** provides applicable labor laws including amendments issued from time to time applicable to establishments engaged in construction of civil works.	Construction and operation
The Child Labour (Prohibition and Regulation) Act, 1986	Prohibits employment of children below 14 years of age in certain occupations and processes Employment of child labor is prohibited in	No child labour should be employed	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	building and construction Industry.		
Minimum Wages Act, 1948	Minimum wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of buildings, roads and runways are scheduled employment.	Applicable to all construction works in the project All construction workers should be paid not less than the prescribed minimum wage	Construction and operation
Workmen Compensation Act, 1923	Provides for compensation in case of injury by accident arising out of and during the course of employment.	Compensation for workers in case of injury by accident	Construction and operation
Equal Remuneration Act, 1979	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.	Equal wages for work of equal nature to male and female workers	Construction and operation
Rajasthan Forest Act, 1953 and Rajasthan Forest Rules, 1962	This Act makes the basis for declaration of Reserved Forests, constitution of village forest committees, management of reserved forests and penalties and procedures.	Not applicable; none of the components / alignment are in reserved or community forest areas.	Construction
IS 11768: 1986/2005: Recommendations for disposal of asbestos waste material	The standard emphasis that every employer who undertakes work which is liable to generates asbestos containing waste, shall undertake adequate steps to prevent and /or reduce the generation of airborne dust during handling, storing, transportation and final disposal of final disposal of asbestos and asbestos containing products.	The crux is waste avoidance: the practice inculcated should focus the on minimal waste generation. Waste Collection: In the project circumstance, the waste is referred to the damaged powered asbestos which will be collected in the Permissible plastic bags to be disposed to the nearest TSDF facilities.	Construction

Law	Description	Requirement	Relevance to Project Phase
IS 12081: Pictorial Warning to be implemented on equipment containing Asbestos Contaminated Products.	The objective of the caution is to make the person handling to take all pre-cautionary measures and make them aware of all the possible risk.	The following signs and personal protective equipment shall be used in handling ACM.  	Construction
IS 11451: Safety and Health Requirements related to Occupational Exposure to Asbestos contaminated Products.	This standard details the occupational exposure allowable and safety at work place to be enforced.	In the project the norms pertaining to limiting number of hours working with ACM will be 8.0 hrs/48 hrs a week and the medical examination has to be periodic, the environmental monitoring has to be done as per the protocol. The safety at work place shall be enforced.	Construction
IS 11768: Waste Disposal Procedure for Asbestos Containing Products.	The protocol pertaining to disposal of the waste is emphasized.	The collection of ACM powered will be in permissible plastic bags, which will be twisted tight at the neck so that the wear and tear due to abrasion will be minimum and the transportation of the asbestos waste has to be done by the authorized vendor to the approved landfill site.	Construction
International conventions and treaties			
Ramsar Convention, 1971	The Ramsar Convention is an intergovernmental treaty that provides the framework for national	There are no Ramsar sites in or near Ratangarh.	Not applicable to Ratangarh drainage subproject.

Law	Description	Requirement	Relevance to Project Phase
	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.		
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973	India is a signatory of this convention which aims to control international commercial trade in endangered species	Not applicable in this project as no endangered species of wild fauna and flora is found in project locations.	-
Montreal Protocol 1992	India is a signatory of this convention which aims to 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 Hydrochlorofluoro carbons (HCFCs)	Not applicable in this project as no ODS are involved in construction works	Not applicable
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 Under this Convention, asbestos or asbestos waste in the form of dust	Not applicable

Law	Description	Requirement	Relevance to Project Phase
		and fibers is classified as hazardous waste.	
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. Migratory species threatened with extinction are listed on Appendix I of the Convention. 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. Migratory species that need or would significantly benefit from international cooperation are listed in Appendix II, and CMS encourages the Range States to conclude global or regional agreements.	Not applicable to this project as no migratory species of wild animals are reported in the project areas.	Not applicable

58. **Clearances / permissions to be obtained prior to start of construction**. **Table 9** shows the list of clearances/permissions required for project construction. This list is indicative and the contractor should ascertain the requirements prior to start of the construction, and obtain all necessary clearances/permission prior to start of construction.

Table 9: Clearances and permissions required for Construction activities

Sr. No	Construction Activity	Statute under which Clearance is Required	Implementation
1	Land for project activity	Allotment and approval for specific land use from Ratangarh Nagar Palika (NOC already taken refer **Appendix 6**)	Ratangarh Nagar Palika
2	Establishment of construction camps	Allotment and approval for specific land use	Contractor
3	Tree Cutting	State forest department/Revenue (Tehsildar)	PIU
4	Hot mix plants, Crushers, Batching plants and DG Set	Consent to establish and consent to operate under Air Act, 1981 from RSPCB	Contractor
5	Storage, handling and transport of hazardous materials	Hazardous Wastes (Management and Handling) Rules. 2016 Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989 from RSPCB	Contractor
6	Sand mining, quarries and borrow areas	Permission from District Collector/ State Department of Mines & Geology	Contractor
7	New quarries and borrow areas	Environmental clearance under EIA Notification 2006	Contractor
8	Use of vehicles and equipment	Pollution under control certificate (PUC) form RTO	Contractor
9	Temporary traffic diversion measures	Temporary traffic diversion measure including use of alternate road from District traffic police	Contractor
10	Use of NH ROW for construction area/ pipeline crossing	PWD-NH	PIU
12	Use of Forest Land for storm water disposal location.	Ministry of Environment Forests & Climate Change (MoEF&CC), Government of India,	PIU

59. PMU will be overall responsible for supervision in getting all clearances and provide details to ADB through semi-annual report. PMU will ensure all necessary regulatory clearances and approvals are obtained prior to commencement of works. Respective PIUs, with support of project consultants and 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 ENVIRONMENT

A. Physical Resources

1. Location, Area & Connectivity

60. Recognized as an entry gate to the great Thar Desert, Churu is located in the desert area of Rajasthan. Churu district is located in the northern part of Rajasthan. It is bounded in the north by Hanumangarh district, in the east by state of Haryana and Jhunjhunu district, south by Sikar and Nagaur districts and by Bikaner district in the west. It stretches between 27º 24' 31.50" to 29º 00' 01.74" north latitudes and 73º 50' 39.45'' to 75º 40' 31.85'' east longitudes covering area of 13,844 sq km. The district does not have a properly evolved drainage system, except for a negligible part in the east which is part of Shekhawati River Basin, almost whole of the district is part of an 'Outside' Basin. Churu district is administratively divided into six blocks and total area

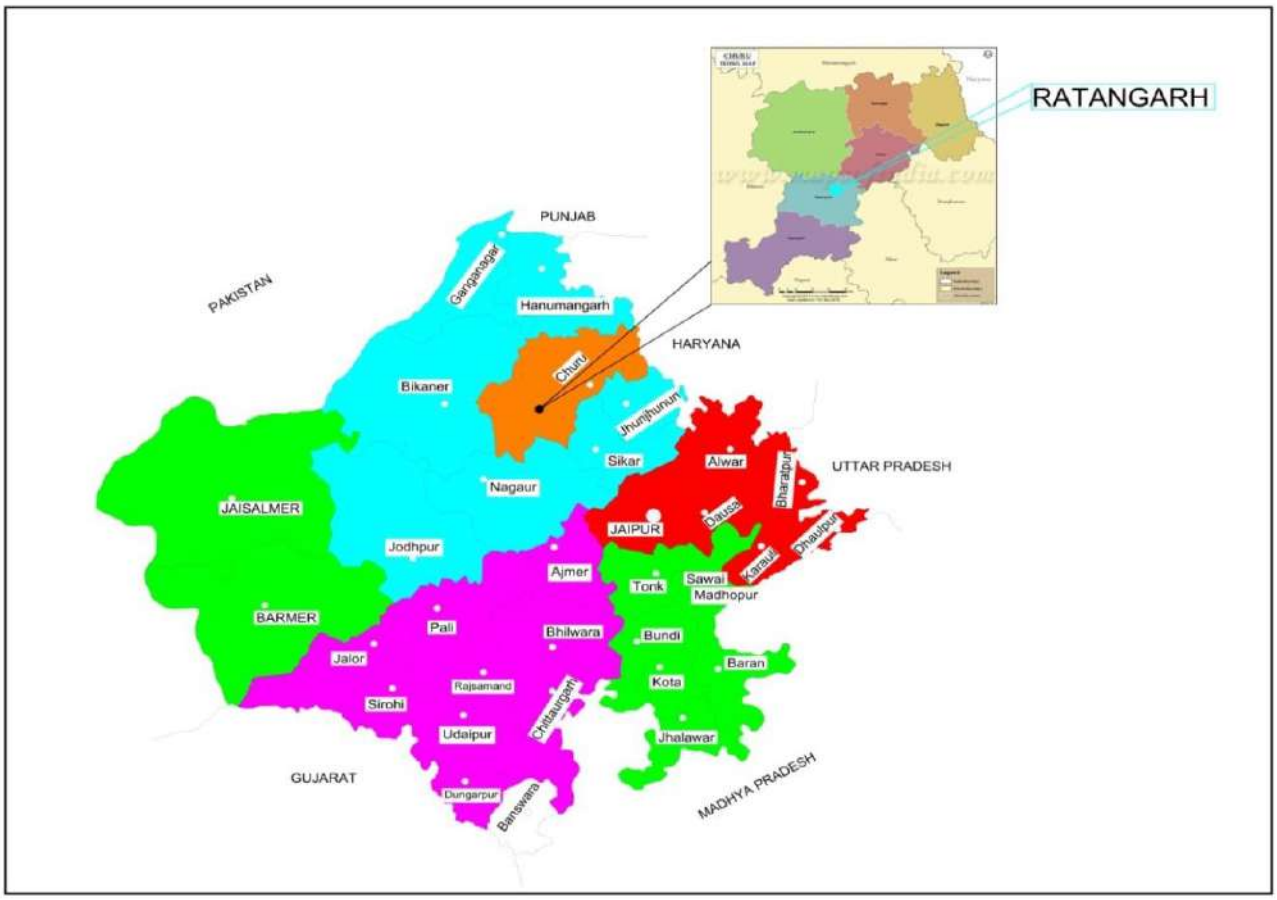
of the district is 13,844 sq.km. It occupies nearly 4.92 percent of the area of the state and stands eight in respect of area amongst the districts of Rajasthan. The district covers 6 Tehsils Churu, Ratangarh, Taranagar, Havellies.

61. Churu district is part of arid region. The district has dry climate and the area is well known for both highest in the country and lowest in the peninsular India recording below freezing point temperature in the winters to over 50 ºC in the summer afternoons. There is a great variation in minimum and the maximum temperature of Churu. Average rainfall in the district is 353.9mm spread over three monsoon months of July to September.

62. Ratangarh is located at 28.08°N and 75.06°E. has elevation of 312 meters. The geographical area of the Ratangarh is about 1,601.9 sq. km. Ratangarh block has 103 towns and villages and occupies nearly 12 percent of the area of the district. Location map of District-Churu showing Ratangarh town is given in **Figure 28**.

63. Ratangarh is part of Shekhawati region. Ratangarh is situated 200 km off Jaipur in the north on NH-52. Ratangarh Junction is a major rail head in northern Rajasthan, connecting Bikaner and Jodhpur Ratangarh is the center as it connects all the major cities in Rajasthan including Jaipur, Bikaner, Sardarshahr and Sujangarh and many small towns.It also connects the northern tip of Rajasthan (Hanumangarh-Sriganganagar) to Jaipur and Ajmer through the High-speed State Mega highway

Figure 28 : Location of Ratangarh Town in Rajasthan State Map



- **Topography, Soils and Geology**

64. District Churu is a part of the great Thar Desert. It is covered with a thick mantle of sand, is characterized by 6 to 30 meter longitudinal dunes treading north east to south west. The general topographic elevation in the district is between 250 m to 300 m above mean sea level. Elevation ranges from a minimum of 199.2 m above mean sea level in Rajgarh block in the northeastern part of the district and maximum of 470.7 m above mean sea level in Sujangarh block in southern part of the district. The general topography is almost an undulating plain area except some hillocks in south. There is no big hill in the district expect some hillocks. There are no perennial rivers or streams in the district. Wells and ponds are the principal source of water supply.

65. The Ratangarh town has an undulating profile with sand dunes here and there. The land profile of the town is such that depressions are found at many places; hence the rainwater accumulates within the town. As such, there is no definite slope in the town providing smooth drainage outside the municipal area.

66. In Ratangarh block elevation ranges from a minimum of 274.7 to 366.99 m above mean sea level.The mean sea level at Railway station is 242 msl while the fort and walled city is much higher, lies between 245 to 310 MSL. The outer city lies between 210 to 250 MSL contours. The hills with naturally developed drainage system ultimately drain into Jojari River which flows from

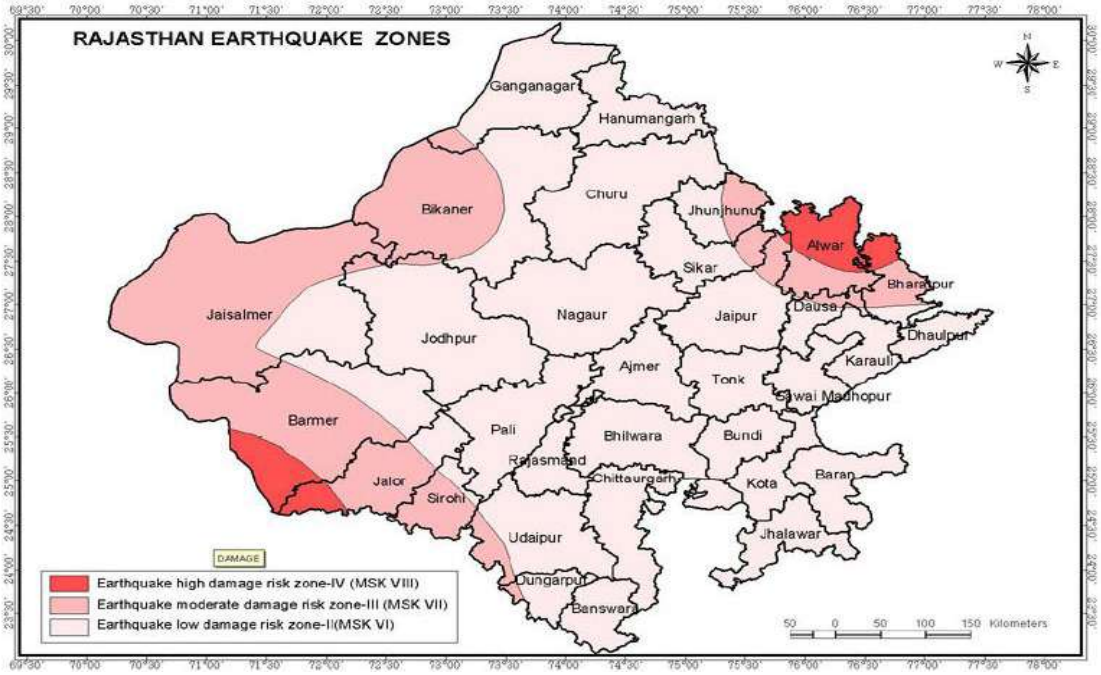
north-east to south-west of the city. It is a non-perennial river. There are extensive stone quarries to the northwest of city. Land to the north-east and south-west mostly consists of plain terrain.

67. Soils: The northern part of the district is covered with sand dunes while southern part is occupied by desert soils. The desert soils are usually light yellowish brown to yellowish brown, calcareous sands with little clay. Their hydraulic conductivity goes up to 13.6 cm/h, while minimum available moisture recorded was 1.1 percent. The large fine sand fraction reflects their being mainly of aeolian origin.

68. The other kind of soil occurring in the district are red desert soils and saline soils of the depression. The project area is generally covered by sand to loamy sand, Aeolian in nature, belonging to mainly Entisols and Aridisols. The red desert soil occupy a narrow belt in southern and western part of the district (south of Sardarshahar and around Ratangarh). They are typically deep brown, non- calcareous, loamy sands and sandy loams, partially derived from sandstone and from alluvial deposit. The hydraulic conductivity of the profile examined near Fatehgarh ranged from 0.5 to 2.5 Cm/h. Minimum available moisture recorded 1.38 percent. The saline soils are found in low interdunal areas, and area of fine texture. Generally, they are saline or sodic having low permeability value and impeded drainage.

69. **Seismology.** As per the seismic zoning map of India, Ratangarh falls under the Zone-II, which is the Low earthquake risk zone in India. This zone is termed as “Low damage risk zone”. Based on available earthquake zone information Zone II is the least seismically active region. The earthquakes in this region had magnitudes of 5.0 or more in the past

Figure 29: Earthquake Zoning Map of Rajasthan



70. **Geology.** The geology of the Churu district is largely concealed by windblown sand and has been worked out on the basis of scanty exposures, from dug well and borehole data. The area, a part of the Thar desert is basically a fluvio–aeolian depositional basin containing 255 m thick pile of Quaternary sediments. It is characterized by an undulating topography consisting of sand dunes interspersed with interdunal valley and linear depressions. The various rock types of

the area belongs to the Delhi Super Group, Erinpura Granite, Malani Igneous Suite, the Marwar Super Group and the Tertiary sediments including the Palana Formation of Paleocene age. The oldest rock sequence in the area belongs to the Punagarh Group comprising of slate, phyllites, quartz-mica schist, ferruginous quartzite etc. of the Delhi Super Group. These rocks are well exposed in south of Bidasar and east of Pandurai Geologically, the area belongs to rocks of Delhi super group. Geological formations exposed in the district reveals that , a longitudinal faults, running at most parallel in NNE-SSW direction and passing from Bidasar-Bandhnau and Sandwa-Kitasar-Ranasar, divides the district into two distinct geological units. The area lying east of Bandhnaw- Bidasar fault which falls under up throw side is known as Sikar basin while the western fault is known as Bikaner basin. In the eastern part of the district due to upthrowing of the fault the Pre-Cambrian crystalline basement have been uplifted, causing practically total erosion of upper horizon of Marwar Super Group (Bhilwara and Nagaur group) and reduction in thickness of Palana series and Quaternary alluvium. The western part of the district which falls under the down throw side of fault have considerable thickness of Palana sediments and rock units of Marwar Super Group are preserved.

- **Climate and Rainfall**

71. ***Temperature****:* The period from March to May temperature increases continuously. May is generally the hottest month with a mean daily maximum temperature of about 41.7°C and mean daily minimum of about 25.1°C. The weather is intensely hot in summer and on some days the day temperature may reach up to 46°C. The highest temperature recorded at Churu is 49°C on 26th May 1998. From November, both day and night temperatures begin to decrease rapidly. January is generally the coldest month with the mean daily maximum temperature at about 22.9°C and mean daily minimum at about 4.6°C. Minimum temperature sometimes drops down to sub zero temperatures and the lowest temperature recorded at Churu is -4.6°C on 16th January 1974.

72. ***Rainfall:*** The district received good rainfall in the year 2010. Rainfall is gradually increasing from Southwest to Northeast. The general distribution of rainfall range is 600 mm to 700 mm in which, it is covering maximum parts of the district. The annual average rainfall was 675.1 mm based on the data of available blocks while highest average annual rainfall was 777.7 mm in Rajgarh block. Lowest annual rainfall was lowest in Sujangarh block (456.9 mm). Rajgarh block has received highest maximum annual rainfall of about 947.2 mm.

73. ***Relative Humidity:*** Most humid conditions are found in the monsoons, followed by post-monsoons, winter and summer in that order.

74. By the proposed sewerage project, all the treated water will be used in beneficial purposes such as agricultural activities etc. that is the major component of the economic sector which is largely dependent on rainfall for agricultural activities. Adequate treated water from treatment plant will ensure the sustainability of more crops per drops in the area/regions and to make less dependent on precious groundwater resources in the area/region.

2. Surface Water

75. Ratangarh block is drained by River Kantli, which flows in northward direction. The river Kantli originates in Khandela hills of Sikar district, thereafter it flows through Jhunjhunu district before drying up in sand dunes of Ratangarh Tehsil of Churu district. There are some small ponds and reservoirs in Ratangarh, which are mostly filled after monsoon and used for irrigation by nearby agricultural fields.

- **Groundwater**

76. Ground water occurs under water table conditions both in unconsolidated and consolidated formations. Its occurrence is controlled by topography, physiography and structural features of the geological formations. The movement of ground water in hard rock areas is governed by size, openness, interconnection and continuity of structurally weak planes while in unconsolidated rocks, ground water movement takes place through pore spaces between grains.

77. Average depth of water table in Ratangarh is about 54mtr. Groundwater generally occurs under confined to semi-confined conditions. The principal aquifers of the area are quartzite, schist, lime stone and dolomite. Lime stone constitutes important water bearing formation in the district. Fluoride content in ground water is on higher side.

78. Groundwater is the main source of irrigation and is utilized through dug wells, and tube wells. The depth to water level varies widely depending upon topography, drainage, bedrock geology etc. in the district. As CGWB Report on Churu District Groundwater Scenario, 2017, depth to water in pre monsoon of 2017 varied from less than 7.81m to more than 66.85m below ground level, while post monsoon varied from 6.66 m to 64.10 m below ground level. In Ratangarhi block, depth to water level ranges between 27.85 and 48.15 m below ground level in pre monsoon of 2017 while post monsoon varied from 27.88 m to 59.68 m below ground level. In terms of pre and post monsoon fluctuation in groundwater level in 2017, according to CGWB Report, there has been rise of more than 4 m in water level in northwestern part of Ratangarh block. Analysis of CGWB's long term water level data of Pre-monsoon (2007-2016) indicate declining trend in water level in most parts of Ratangarh block.

79. **Groundwater Utilization.** In Ratangarh Block/Tehsil, while the estimated net annual groundwater availability is 27.01 MCM, the total utilization for all uses is estimated as 20.09 MCM (74.40% utilization). Ratangarh Block is classified as "SEMI CRITICAL" (74% utilization with long term decline in groundwater in some parts). CGWB recommend cautious groundwater development in Semi Critical areas.

- **Groundwater Quality.**

80. As per CGWB report (2017) the quality of ground water is alkaline in major part of the district. Presence of excess fluoride, nitrate, iron and electrical conductivity in ground water has been reported from some pockets in the district. Fluoride in excess of maximum permissible limit has been observed in parts of Rajgarh,Sardarshahar, Ratangarh, and Sujangarh blocks. Baseline Ground Water quality testing will be conducted in nearby location of SWPSs, Disposal Point and Pipe laying Sites during the pre-construction phase by the contractor.

- **Air Quality**

81. Ambient air quality in Rajasthan is monitored by Rajasthan Pollution Control Board and therefore no data on ambient air quality available. Although, ambient air quality in Ratangarh town is also being conducted by RUIDP –IV under Ratangarh sewerage subproject and last monitoring data of 16.03.2022 to 24.03.2022 duration are presented in Table 10.

Table 10: Ambient Air Quality Monitoring Result

Location	Results				
	CO (µg/m^3)	**NO_2 (µg/m^3)**	**SO_2 (µg/m^3)**	**PM_{10} (µg/m^3)**	**$PM_{2.5}$ (µg/m^3)**
SPS 3.8 MLD Ratangarh	<1	22.63	10.92	85.28	43.49
STP 3.8 MLD Ratangarh	<1	20.43	9.11	82.69	39.56
Labour Camp	<1	21.76	10.80	83.67	41.35
SPS 4.6 MLD	<1	22.48	10.91	81.30	40.27
Near Govt Hospital	<1	19.73	9.16	75.29	34.65
Ambient Air and Noise Quality Standards (National Ambient Air Quality Standards)					
Standards	**CO (µg/m^3)**	**NO_2 (µg/m^3)**	**SO_2 (µg/m^3)**	**PM_{10} (µg/m^3)**	**$PM_{2.5}$ (µg/m^3)**
India Ambient Air Quality Standard	2,000 (8-hr) 4,000 (1-hr)	40 (Annual) 80 (24-hr)	50 (Annual) 80 (24-hr)	60 (Annual) 100 (24-hr)	40 (Annual) 60 (24-hr)
IFC Standards (µg/m^3)	2,000 (8-hr) 4,000 (1-hr) 100,000 (15-min)	40 (Annual) 80 (24-hr) 200 (1-hr)	50 (Annual) 20 (24-hr) 500 (10-min)	20 (Annual) 50 (24-hr)	10 (Annual) 25 (24-hr)

Source: Ratangarh sewerage subproject 1st season (Jan. to March) data

82. Air quality monitoring results are within National standards for all parameters in all 5 locations, whereas PM10 (ranges from 75.29 to 85.28 µg/m3) and PM 2.5 (ranges from 34.65 to 43.49 µg/m3). All other parameters are within prescribed limits as per both standards. However, both PM 10 and PM 2.5 are above the IFC standards in all locations.

- **Noise Quality**

83. As there are no major industries or other activities, which may create high noise in town, the main source of noise pollution in the city area is traffic only that also in main and busy roads and other inner and connecting roads are quite peaceful. Environmental monitoring for ambient noise at the locations of SWPSs, Disposal Point and Pipe laying Sites during the pre-construction phase by the contractor.

B. Ecological Resources

84. **Flora and Fauna in the study area.** Churu district is a part of the Indian Great Thar desert. The district has only 6663 hectare area under the forest which is only 0.46% of the total area of the district. The vegetation cover in the district is almost negligible due to extremes of temperature during winter and summer and scanty rainfall established sand dunes inside Grass Reserves of inside areas, free from biotic interference, contain very poor and open forest. Important trees found in the district are Khejara, Kikar, Neem, Hingotaker, Shisham, Rohira, Bhhui, Phog, Ask, Senia, Thor, Morali, Bura, Lampre, Kucha, Mural etc.. Fox, Blue, Bull, common hare, Jackal porcupine, Bats and Bush rats etc. are found here. The common birds found here are Bulbul, kite, Owl, Pigeon, Sand Grouse, Grey partridge, Godavan of Gurah

85. **Common Flora in Ratangarh**: Common trees found in Ratangarh are- Neem (Azadirachta indica), Dhak (Butea monosperma), Gulmohar (Delonix regia), Imli (Tamarindus indica), Pipal (Ficus religiosa), Ker (Capparis decidua Forsk.), Bargad (Ficus bengalensis Linn.), Babool (Acacia nilotica), Avla (Emblica officianalis Gaerth.), Siris (Albizia lebbeck), Vilayati babool (Prosopis juliflora) etc.

86. **Common Fauna of Ratangarh:** Common animals found in Ratangarh area are- Birds- Baya weaver (Ploceus philippinus), White-throated kingfisher (Halcyon smyrnensis), House swift (Apus affinis sub sp. affinis), Rock Pigeon (Columba livia), Indian peafowl (Pavo cristatus), Jungle crow (Corvus macrorhynchos), Mammals- Five strippedpalm squirrel (Funambulus pennantii), Common House Rat (Rattus rattus), Hare (Lepus nigricollis), Garden lizard (Calotes versicolor). It is also observed that the faunal species found in the study area are commonly found species. No rare, endemic & endangered species are reported in the core / buffer zone of project areas.

87. The avifaunal profile recorded in the quadrat studies is dominated by birds associated with open scrub such as Grey Francolin, Laughing Dove, Indian Robin, Common Stonechat, Brahminy Starling, Common Babbler and Yellow-eyed babbler. Some wetland associated species were also recorded on Main Ginani They include resident species such as little grebe, Asian Openbill and Red-wattled Lapwing, and no migratory species were seen during the visit. Birds associated with habitation, cultivation and gardens, including Indian Peafowl, Indian Roller, Common Pigeon, Common Myna, Red-vented Bulbul and Ashy Prinia are also found.

88. **Migratory Avifauna**. The subproject area is part of the massive avian migratory channel called the Central Asian Flyway (CAF), which spans the entire Indian subcontinent. Thus, the subproject area lies in the path of various winter migratory birds entering the Indian subcontinent from the north and headed farther south. With its diversity of habitats, the area in general is likely to be providing seasonal habitats or staging points to many of these visitors. Local people, public representatives and forest officials were consulted during the site visit confirmed that there are no migratory birds noticed in the water bodies in and around Ratangarh town. There is no notable wildlife presence / movement indicated during the consultations with locals and forest officials.

89. There is no protected area within the project influence zone. Nearest protected area is Tal Chhapar Sanctuary, the boundary of which is 33 km south-west (aerial distance) from Ratangarh Town and project activities do not interfere with sanctuary. **Tal Chhapar** Sanctuary is a sanctuary located in the Sujangarh Tehsil of Churu District of Northwestern Rajasthan in the Shekhawati region of India. It is known for blackbucks and is also home to a variety of birds. It lies on the Nokha-Sujangarh state highway and is situated at a distance of 33 km from subproject sites.

90. There are no protected areas or locations of any ecological interest at or near any of the work sites, so it is unlikely that the construction process will have any ecological impacts. However (i) Rising mains from SWPS No. 4 (Main Ginani) to Disposal point 3 (Near mega highway Sardarsahar) and (ii) Rising main crossing to NH-52 and Disposal point 3 falls in the protected forest land " Kasba Ratangarh Forest". Approx. 0.15 ha forest area is required for this subproject component. Therefore forest land diversion is required and it will be taken from MOEF&CC Regional office Jaipur. Predominant floral species in Kasba Ratagargh protected forest and notified protected forest along NH-52 are mainly: - Acacia juliflora, Neem, Shisham, Sirus, Babul and Ber etc.

91. Screening of project areas is carried out based on Integrated Biodiversity Assessment Tool (IBAT) and IBAT proximity area report shows that there is no protected or key biodiversity area within 10 km of Ratangarh (Appendix 8). There are total 29 species of IUCN Red List potentially found within 50km of area of interest in IBAT assessment. IUCN Red List species are categorized mainly 18 nos. are vulnerable, 6 nos. are endangered and 5 nos. are critically endangered.

92. **Profile of Tal Chhaper sanctuary**. The sanctuary is named after Chhapar village which is located at 27°-50' North and 74°-25' East. It is a flat saline depression locally known as a "tal"

that has a unique ecosystem in the heart of the Thar Desert. Perched at a height of 302 meters (990 feet) above sea level. Tal Chhaper Sanctuary, with almost flat tract and interspersed shallow low-lying areas, has open grassland with scattered Acacia and Prosopis trees which give it an appearance of a typical savanna. The word "tal" means plane land. The rain water flows through shallow low-lying areas and collect in the small seasonal water ponds.

93. The geology of the zone is obscured by the wind-blown over-burden. Some small hillocks and exposed rocks of slate and quartzite are found in the western side of the sanctuary. The area between hillocks and the sanctuary constitutes the watershed area of the sanctuary. The whole sanctuary used to be flooded by water during the heavy rains but with salt mining going on in the watershed, hardly any rain falling on the hillocks reaches the sanctuary. Nearby villages are Jogalia, Jaitasar, Bidasar.

94. The forest of this region falls under major group "Tropical Forest" as per classifications of Indian forests by Champion & Seth. The forest of sanctuary area again falls under the group "Topical Thorn Forest" and sub group 6B/C "Desert Thorn Forests".

95. The sanctuary area is mostly covered by grasses with a very few trees. It lies on the passageway of many migratory birds such as harriers. These birds pass through this area during September. Birds commonly seen in the sanctuary are harriers, eastern imperial eagle, tawny eagle, short-toed eagle, sparrow, and little green bee-eaters, black ibis and demoiselle cranes, which stay till March. Skylarks, crested larks, ring doves, and brown doves are seen throughout the year. Desert fox and desert cat can also be spotted along with typical avifauna such as partridge and sand grouse.

96. Tal Chhapar Sanctuary comes alive with the chirping of various migratory birds including Montagu's harrier, marsh harrier, pale harrier, imperial eagle, tawny eagle, short toed eagle, sparrow hawk, skylark, crested lark, ring drove, brown dove, blue jay, southern grey shrike, Indian spotted creeper, green bee eaters, black ibis and demoiselle cranes.

97. Among the other wildlife beauties then it is a fact that Tal Chhapar Sanctuary is famous for black-bucks. Tal Chhapar wildlife sanctuary is the sole place having a good population of Black buck in such a small area. The sanctuary is a home to nearly 1680 Black Bucks. Being a natural home of Blackbucks and one can easily see 500-700 animals in a single herd. It is the only sanctuary in India in which is having a good number of blackbucks in an almost tree-less, saline and flat-land. These black bucks have “Mothiya” for their food.

C. Economic Development

98. Land use. The geographical area under the Ratangarh Nagar Palika was 2288 acre, out of which developed area is 1704 acre and the rest is mainly agriculture land. Existing Land use of Ratangarh Town is given in Table 11.

Table 11 : Existing Land Use of Ratangarh Town (2011)

Category	Area in Acres	Percentage to Total Developed Area	Percentage to Total Municipal Area
Residential	977	57.34	43.85
Commercial	39	2.29	1.75
Industrial	58	3.40	2.60
Public & Semi Public	16	0.94	0.72

Category	Area in Acres	Percentage to Total Developed Area	Percentage to Total Municipal Area
Recreational	303	17.78	13.60
Transport & Communication	295	17.31	13.25
Total Developed Area	**1704**	**100**	**-**
Agricultural and vacant land	513	-	23.02
Water Bodies	11	-	0.49
Total Municipal Area	**2228**	**-**	**100**

Source: Ratangarh Master Plan, 2011-2031

99. **Industry and Agriculture.** Churu district offers all the important infrastructure facilities essential for economic and industrial growth like water, power, transport, industrial training, industrial area etc. Total numbers of registered units in district are 1800 out of which Forest Based 489, Miscellaneous & Service 337 (Hotel & Restaurants, laundry, tent house, Auto mobile workshop, Mobile repairing and maintenance, offset printing, printing press, transportation), Cotton & Textile 251, Engineering & Metal 233, Non-Metallic Minerals Products 165, Agro & Food Processing 115. Micro & Small Enterprises products which have export potential and also being presently exported from the district are handicrafts items like wooden decorative pieces & article, leather jutis, sandal, guar gum, wood items etc.

100. In Ratangarh, there is no major industrial development in the project area and there are no large industries in the town. Only small and medium scale industries in Ratangarh. RIICO industrial area is developed on the Hanumangarh-Kishangarh Mega Highway, where there are 72 industrial units in operation. Main industries in Ratangarh are mini cement plant, wooden furniture and handicrafts, cement electric poles manufacturing, stone and steel furniture etc. Other industries in the town are stone door frames, wood furniture and handicraft, soap, ice, printing press, weaving, cement bags etc.

101. Millet, Kidney-bean, Moth, gram, mustard, Tara Mira and Ground Nuts are other crops cultivated in this area. The agriculture is mainly based on the monsoon but in some tehsils, irrigation is made by extracting water from wells. But the successes not satisfactory due to salty and deep water.

102. Water Supply. The major source of drinking water for Ratangarh is tube well and open well. The Public Health Engineering Department takes care of the water supply in the town. The present water supply capacity in the town is that of 44 liters per capita per day. The supplied water quality is good and testing is done periodically to ensure that the water treatment plant is operating effectively.

103. Sewerage. There is no functional sewerage system in Ratangarh town. Most of the residential and commercial buildings and educational institutions have on-site septic tanks and soak pits. The effluent from the septic tanks is directly let out in the open drains, which pollutes environment.

104. Solid Waste Management. Ratangarh Nagar Palika collects solid waste via door-to-door collection systems through an NGO under supervision of Nagar Palika stafsf from all municipal wards. Nagar palika is having 25 auto tipper, 6 tractors for collection of solid waste in the city. Coverage is about 90% population. Waste from community dust bins/open collection points is manually lifted into vehicles for transportation to the disposal site. Currently there is no solid waste processing facility and solid waste is dumped without any segregation in vacant government land

at Loonch Ki Jodi area. The un-segregated waste collected from the city is disposed-off by crude open dumping method at the site. There is no landfill facility in the city. In the project sites, the estimated volume of solid waste is as follows:

Solid waste estimates at project sites

Component	Design Capacity (MLD)	Volume of Solid Waste (cubic meters)
SWPS-5	10	3250.72
SWPS-4	410	21035.4

105. Storm Water Drainage. Drainage system in Ratangarh town is in the form of road-side open drains, and major drains that convey runoff from the city collector drains to natural water bodies through open nallah. Due to lack of sewerage system, these drains primarily carry sullage and sewage discharged by. As the city is located in Thar Desert region, there are no defined natural drainage pattern, there are no streams or channels in the town. Region receives low rainfall, runoff during the rains is accumulated in the low-lying areas, which is quickly lost to evaporation / infiltration. Wastewater from the town area is also accumulated in low lying areas in the town. Municipality constructed drainage pumping stations at few places, to pump out the accumulated wastewater to outside the town.

D. Socio Cultural Resources

1. Demography

106. According to 2011 census, Ratangarh Municipality has population of 71124 out of which 36,355 are males while 34,769 are females. Literacy rate of Ratangarh city is 75.76 % which is higher than the state average of 66.11%. In Ratangarh, male literacy is 86.70 % while female literacy rate is 64.48%. Population of Children with age of 0-6 is 10041 which is 14.12% of total population of Ratangarh. In Ratangarh Municipality, female Sex Ratio is 956 against state average of 928. Scheduled Caste (SC) population comprises 19.29 percent of the total population. Workforce participation rate in Ratangarh is 32 percent, which is higher the State level WPR of 29.6%. Largest proportion of population comprises Hindus followed by Muslims and Christians. Main languages spoken are Rajasthani, and Hindi.

2. History, Culture and Tourism

107. History: Churu district was founded in 1620 AD by the Nirban clan of Rajputs. Churu was a part of Bikaner district before the Independence of India. In 1948, it was separated from Bikaner when it was reconstituted.

108. According to historical documents Ratangarh was founded by Surat Singh, the maharaja of Bikaner in the year 1798 (Samvat 1855) while he was returning from Churu with his son Ratan Singh. He selected the place Kolasar and Rajia ki Dani for a new town and named it Ratangarh on his son's name. He handed over the responsibility to Purohit Hulashchand, Deepchand and Charan Sidayach Shankar to build Ratangarh as a modern 1812 (Samvat 1869) during the layout of Ratangarh. According to some old people, present Ratangarh was built at Kolasar village, and Asha Charni (Lado Bhuwa) constructed Raghunathji temple.

109. A historical Devali was found near village Hudera just three kilometers from Ratangarh. This is located at MEGA HIGHWAY near by 220KV GSS, Devali of Samvat 1309 was found in an

old Sidhan Jogioan Nath math. According to historians this Devali is nearly 750 years old. As per a text written on Devali, This Devali is the wife of Rathoor Nahardass when she became satti on Baishak sudi 1, Samvat 1309. A similar Devali was also found in Rajaldeshar near Ratangarh. This Devali called Rajasi ki Devali is also 475 years old. Samvat 1581, Ashad Sudi 10 is written on the Devali. An artistic slab stone of 11th Centaury engraved with dancing figures was found in Ratangarh which is now placed in Government Museum, Bikaner.

110. In the year 1812 (Samvat 1869) Ratangarh fort was also completed. It is said that Ratangarh fort was attacked two times by Thakur Prithvi Singh of Churu with the support of Maharaval Laxman Singh of Sikar in the year 1815 and 1816 (Samvat 1872and 1873). In both attacks caretakers of Fort Lalshah Syed and Purohit Jethmal were killed. According to famous historian Gourishankar Hirachand Ojha, Maharaja Ratan Singh held a meeting with Cornel Velsin in 1834 to organize the Shekhawati Brigade of English army.

111. Ratangarh was planned before construction and its bazaar is laid out in the design of a cross with shops painted like the town. The massive fort (garh) was constructed in the middle of the town with a boundary wall around the city with four gates. A second small fort was built in the city. But now the original fort and also the second fort has nothing left except for a few ruined monuments and now used as offices of civil courts. A Clock Tower is at the main crossing of the bazaar called Ghantagar.

112. Ratangarh is a place of well-known businessmen, learned people, great saints, literary persons, poets, vaidyas, artists and great patriots. Ratangarh was also called second Kashi due to its center of learning. Shri Hanuman Prasadji Poddar founder 'Kalyan' is an international figure. Shri Jeevanand Anand freedom fighter, Social worker who worked whole life for promotion of Sanskrit, vedshastra and puran. he had also established the value of Sanskrit education in Rajasthan through Rajasthan Rishikul Brahamcharyaashram.

113. With the efforts of Maharaja Ganga Singh railway station built in 1910 and electricity was availed in 1930. Water Works was built and Water to houses was introduced in 1945 by Seth Durgadutt Anantram Thard. Seth Soorajmull Jalan, Sitaram bhuwalka, Seth Nagarmal Bajoria and Seth Jethmal Dhanuka were the main contributors to develop the town in the present form. They laid network of roads (in 1945), opened hospital (1939), schools and colleges, public library, parks and several charitable society.

114. **Culture and Tourism.** Ratangarh region also remain the part of ancient culture. A 10th-century stone silalekh engraved with folk dance was found from an old temple now placed in Bikaner museum. Ratangarh Mathadish Sivalaya was supposed to be built 200 years before the foundation of Ratangarh. Bikaner maharaja Sujan Singh (Year 100- 1735) gifted Kolasar village (present Ratangarh) to Charan Mala of Nath sect for his Rajasthani literature ' Gari bat doye' . Charan Mala built 'Karniji temple' in Kolasar which now at the heart of the town. Sidhan Math of Nath sect in Hudera village is said to be built in early 10th century

115. There are so many temples in Ratangarh that it has earned the nickname "the Varanasi of Rajasthan". Some of the important temples are: Shree Talwale Balaji Mandir; Shree Chowk Wale Balaji, Churu Road; Panchmukhi Balaji; Mehandipur Balaji; Sankatmochan Balaji; Shirdi Sai Mandir.

116. Gugoji is a holy place about 16 km far away from Sadulpur (Ratangarh), it is also called as Dadrewa village in Churu district. Gugoji is known as the god of snakes and is visited

throughout the year by people from different parts of the country many people from North and all over India come to pray here.

117. Salasar Balaji Temple - Located in the town of Salasar near Sujangarh, Salasar Balaji is the temple of Lord Hanuman. Fairs are organized every year on Chaitra Poornima and Ashwin Poornima at Salasar Balaji temple. The place also houses Rani Sati temple and Khatu Shyamji temple as well. Salasar Balaji is also known by the name of Salasar Dham. Salasar Balaji is about 75 kms from Ratangarh.

118. Tal Chhappar Sanctuary- Tal Chhappar sanctuary is located in the Shekhawati region of the state of Rajasthan. The sanctuary is known for its rare blackbuck. The Tal Chhappar sanctuary is located at the edge of the Thar desert on the Ratangarh-Sujangarh highway. Geographically, the sanctuary falls in Sujangarh Tehsil of Churu and is an amusement place for the visitors. The sanctuary is at a distance of 85 km from Churu city and at 33 km (aerial distance) from Ratangarh town.

119. There are no ASI or state protected monuments within the project influence zone. The nearest ASI monuments is Harshnath Temple on Harsh Hill in Sikar at 83 km distance in south-east direction, and the nearest state protected monuments is Fatehpur Fort in Fatehpur Town at 32 km distance in south-east direction.

E. Environmental Settings of Investment Program Component Sites

120. There are no protected areas or locations of any ecological interest at or near any of the work sites, so it is unlikely that the construction process will have any ecological impacts. The Nearest protected area is Tal Chhapar Sanctuary, which is about 33 km (aerial distance in south-west) of Ratangarh town. Screening of project areas is carried out based on Integrated Biodiversity Assessment Tool (IBAT) and IBAT proximity area report shows that there is no protected or key biodiversity area within 10 km of Ratangarh.

121. There are no ASI or state protected monuments within the project influence zone. The nearest ASI monuments is Harshnath Temple on Harsh Hill in Sikar at 83 km distance in south-east direction, and the nearest state protected monuments is Fatehpur Fort in Fatehpur Town at 32 km distance in south-east direction. Site environmental features of all subproject sites and photographs are presented in the following Table 12.

Table 12: Environmental Features of Proposed Alignment

Sr. No	Subproject components	Environmental Features of the Site	Photographs
Storm water pumping station (SWPS)			
1	Construction of SWPS -1 of 1.1 mld near Railway quarter (Coordinates: 28°04.'02.70"N **;**74°37'32.57"E	• Storm water pumping station (SWPS) of 1.1 mld is proposed in the vacant land adjacent to the existing pumping station. • Land is under the possession of Nagar Palika, Ratangarh.	

Sr. No	Subproject components	Environmental Features of the Site	Photographs
		• The site is near to the Ratangarh Railways Junction and Railway quarters. • The nearest habitation from the site exists at a distance of 55 meters. • The Site is approachable via Ratangarh city roads. • Tal Chappar Sanctuary is approximately 33 km away from this site • Nearest forest area from this site is located at a distance of 1.7 km. • There is no ASI and state protected monuments within 10 km radius. • Land parcel is adjacent to the collection point for local wastewater discharge. • Total land required for SWPS -1.1 MLD is 100 m^2 and sufficient land 6867.74 m^2 is available for the said work. • Confirmation of land availability and no objection certificate – (NOC) of Nagar Palika, Ratangarh is obtained.	 Photographs of proposed pumping station - Near Railway Quarter
2.	Construction of SWPS-2 of 2.3 mld near Saraf sump well (Coordinates: 28°04.'10.54"N 74°37'44.18"E	• Storm water pumping station (SWPS) of 2.3 mld is proposed in the vacant and unused land adjacent to the existing pumping station at Saraf Sump Well • Land is under the possession of Nagar Palika, Ratangarh. • Total land required for SWPS of 2.3 mld is 127 m^2 and 215.33 m^2 land is available for the said work.	 Location of proposed pumping station

Sr. No	Subproject components	Environmental Features of the Site	Photographs
		• The nearest habitation to the SWPS-2 is at a distance of 17 meters. • The site is approachable via city roads. • Tal Chappar Sanctuary is approximately 33 km away from this site. • Nearest forest area from this site is located at a distance of 1.82 km. • There is no ASI and state protected monuments within 10 km radius. • . Confirmation of land availability and no objection certificate – (NOC) of Nagar Palika, Ratangarh obtained.	
3.	Construction of SWPS-3 of 4.6 mld near Parmana Taa l (coordinate: 28°04.'52.27"N ; 74°37'43.81"E)	• Storm water pumping station (SWPS) of 4.6 mld is proposed in the vacant land, adjacent to the existing pumping station near Parmana Taal • It is located adjacent to Parmana Taal • Land is under the possession of Nagar Palika, Ratangarh. • Total land required for SWPS-3 is 150 m^2 and 165.80 m^2 land is available for the said work. • Nearby habitation is present at a distance of 30 meters from the proposed site • Tal chappar Sanctuary is approximately 33 km away from this site • Nearest forest area from this site is located at a distance of 1.4 km.	 Proposed location of Pumping Station

Sr. No	Subproject components	Environmental Features of the Site	Photographs
		• There is no ASI and state protected monuments within 10 km radius.	
4.	Construction of storm water pumping station (SWPS-4) of 10 mld near Main Ginani (Coordinates : 28°04.'43.14"N N"; 74°36'40.74"E)	• Storm water pumping station (SWPS) of 10 mld is proposed in the vacant land, adjacent to the existing pumping station. i.e. Main Ginani, Ratangarh. • Land is under the possession of Nagar Palika, Ratangarh. Land parcels currently serve as collection point for local wastewater discharge and are not under any other use by local community or government. • Total land required for SWPS-4 is 400 m^2 and sufficient land (12519 m2) available for the said work. • Land is owned by Ratangarh Municipality full of solid waste materials dumped on site. The estimated solid waste is 21035.47 cubic meter • Nearest habitation is present at a distance of 20 meters. • Tal Chappar Sanctuary is approximately 33 km away from this site • This site lies within the Kasba Ratangarh district forest area. • There is no ASI and state protected monuments within 10 km radius.	 Photographs of proposed location of pumping station

Sr. No	Subproject components	Environmental Features of the Site	Photographs
5.	Construction of storm water pumping station (SWPS-5) of 10 mld near BSNL office (Coordinates: 28°04.'22.00"N ;74°37'34.91"E)	• Construction of storm water pumping station (SWPS) of 10 mld is proposed within the vacant area of existing pumping station near BSNL office. • It is located near Ratangarh Head Post Office and BSNL Office • Land is owned by Ratangarh Municipality and has significant solid waste materials dumped on site, estimated to be 3250.72 cubic meters. • Land parcels currently serve as collection point for local wastewater discharge and are not under any other use by local community or government. • Total land required for SWPS-5 is 400m^2 and sufficient land 69571 m^2 is available for the said work. • Confirmation of land availability and no objection certificate – (NOC) of Nagar Palika, Ratangarh is obtained • This Site is situated located at 52 meters distance from the nearby habitation. • Approachable via City roads • Tal Chappar Sanctuary is approximately 33 km away from this site • Nearest forest area from this site is located at a distance of 1.33 km. • There is no ASI and state protected monuments within 10 km radius.	 Proposed location of pumping station

Sr. No	Subproject components	Environmental Features of the Site	Photographs
6	Construction of storm water pumping station (SWPS-6) of 1.1 mld near Hanuman Park (Coordinates: 28°04.'22.67"N; 74°36'40.17"E	• Location of this SWPS-6 is on Hanuman Park Road, Ratangarh. • Nearby landmark is Bachpan Play School at 70 m in north-west direction. • Nearest habitation is present at a distance of 20 meters. • Approachable via City road • Tal chappar Sanctuary is approximately 33 km away from this site • Nearest forest area from this site is located at a distance of 0.77 km. • There is no ASI and state protected monuments within 10 km radius. • No involuntary acquisition of private land is anticipated for this project. However, for the construction of storm water pumping station 150 m^2 land is donated by local residents . . • As this area is continually flooded and not in any use, the Ratangarh Municipal Body selected this land for the storm water pumping station location upon confirmation of land donation by landowners. • During impact assessment, it was confirmed that this land was being used as a wastewater disposal site from many years and is not under any productive use.	 Photographs of proposed location of pumping station

Sr. No	Subproject components	Environmental Features of the Site	Photographs
		• The total land donated by landowners is 150 m^2 that will be used for construction of storm water pumping station.	
Raw Water Reservoirs (RWR) at Disposal Points Three nos. of Raw Water Reservoirs for storage of storm water are proposed at disposal locations for utilization of storm water. Raw Water Reservoirs capacity is 30 ML each and dimension is L(150m) X B (80m) XSWD (2.5m)			
1.	Disposal point 1- South of National highway-11 owned by Nagar Palika;Ratangarh Coordinates: 28°02.'59.60"N ; 74°37'40.98"E Pumping stations; Near Railway Quarter (SWPS1) and Saraf sump well (SWPS2)	• Under this scheme, through pumping main, all the storm water from SWPS 1 (near Railway Quarter) and SWPS 2 (Saraf Sump well) locations will be disposed in the land owned by Municipality, south of national highway-11. • dentified land for the proposed component is government land under possession of Nagar Palika, Ratangarh. • Identified site is reported vacant, unused and without any settlement/ squatter or other use.. • Total available are is approx. 22257 sq. m and required area is also 10200 sq. m. • No-objection of Nagar Palika is obtained • This proposed sites is 200 meters away from the nearest habitation. • The Proposed site is approachable via village gravel roads. • Tal chappar Sanctuary is approximately 33 km away from this site.	 Photographs of RWR at disposal point- south of National Highway-11

Sr. No	Subproject components	Environmental Features of the Site	Photographs
		• Nearest forest area from this site is located at a distance of 3.33 km. • There is no ASI and state protected monuments within 10 km radius.	
2.	Disposal point 2- near Mega Highway Sardarsahar - Gaushala Land (Pinjrapole Society) Coordinates: 28°05.'31.68"N; 74°37'10.58"E Pumping Station: Near BSNL office (SWPS 5)	• Under this scheme, through pumping main, all the storm water from SWPS -5 near BSNL office will be disposed of in the land near mega highway Sardarsahar, owned by Gaushala - Pinjrapole Society. • Land required for raw water reservoirs/disposal point is 10200 m^2 and available land is 607020m^2. • No-objection will be obtained from Gaushala Trust (Pinjrapole Society) prior to commencement of civil works and same will be appended to the updated IEE. • Nagar Palika, Ratangarh has issued letter to Gaushala Trust Pinjrapole Society for provide no-objection for proposed disposal of storm water drain in their land; • Presently, town storm water is being disposed in the gaushala trust land and they are utilizing the same for irrigation of crops/ green fodder. • Nearest habitation is present at a distance of 3000 meters.	  Photographs of RWR at disposal point- Gaushala Land - Pinjrapole Society. near mega highway Sardarsahar

Sr. No	Subproject components	Environmental Features of the Site	Photographs
		• Site is approachable via Churu-Sardarshahar Bypass Road. • Tal chappar Sanctuary is approximately 33 km away from this site • There is no ASI and state protected monuments within 10 km radius	
3.	Disposal Point- 3 West of Main Ginani, Coordinates: 28°04.'48.29"N ; 74°36'11.43"E Pumping stations : SWPS-3 (Parmana Taal), Main Ginani (SWPS 4) and SWPS-6-Hanuman Park	Under this scheme, through pumping main, all the storm water from SWPS-3 (Parmana Taal), Main Ginani (SWPS4) and SWPS-6-Hanuman Park will be disposed of in the land at west of Main Ginani, owned by Forest department. • No-objection will be obtained from Forest department prior to commencement of civil works and same will be appended in updated IEE. • Nagar Palika, Ratangarh has already issued letter to Forest department for provide no-objection for proposed disposal of storm water drain in their land. • Location of this Disposal Point is near Mega Highway, Ratangarh • Nearby landmark is Bachpan Play School at 70 m in north-west direction • Nearest habitation (Quarters of Electricity Dept. is present at a distance of 190 m meters. • Approachable via City Road	  RWR at Disposal point- west of Main Ginani- Forest department

Sr. No	Subproject components	Environmental Features of the Site	Photographs
		• Tal Chappar Sanctuary is approximately 33 km away from this site • There is no ASI and state protected monuments within 10 km radius • Total land required for raw water • Reservoirs and disposal site is 10200 m^2 and sufficient land is available for the said work.	
Rising Mains and Gravity Main			
1.	Rising Mains and Gravity Main	• A rising main- 10.12 km of diameter (150 and 400 mm) and gravity main of 0.96 km of dia 600 mm is proposed in the centre of the road which is owned ny Nagar Palika, Ratangarh for disposal of storm water from SWPS to Disposal point • Proposed alignment will pass through unused /vacant/barren public lands /road ROW of Nagar Palika, Ratangarh. Transect walk conducted along the proposed rising main alignment has confirmed that no commercial establishment - permanent shops or mobile vendors exist along the route and no economic impact is anticipated. • No impact (either temporary or permanent) on structures and common property resources (CPRs)[7] is envisaged.	 

7 Common property resources include public resources and generally refer to community-owned facilities or cultural property such as temples, shrines, public utility posts, pastureland etc. Its usage is shared by a community group or set of groups.

Sr. No	Subproject components	Environmental Features of the Site	Photographs
		• Rising Main Pipe Line from SWPS-3 (Parmana Taal) to and SWPS 4 (Main Ginani)to Disposal Point 3 at Forest land will cross NH-52 and Disposal Point No.3 falls in the forest land (in Kasaba Ratangarh Forest Block) and approx. 0.15 ha forest will required for these components, Therefore diversion is required and it will be taken from MOEF&CC Regional Office Jaipur. • At SWPS 2,4 and 5 the existing rising mains of approx. 5410 m is of AC pipe material. The rising mains are damaged at many places and as such, new rising mains are proposed. • No of Asbestos Cement Material (ACM) is proposed to be used in the subproject construction. The sub-project, however, do not include rehabilitation or repair of AC pipes, and the project, in fact, designed to discontinue the use of AC pipes. • Construction of gravity mains of 0.96 km of diameter 600 mm to channelize flow to SWPS inlet at Main Ginani and near Hanuman Park SWPS are proposed	

Sr. No	Subproject components	Environmental Features of the Site	Photographs
2.	**Road Restoration:**	Rising main of dia 150-400 mm and gravity main of dia 600 mm is proposed and will be laid within the ROWs of existing roads. Road cutting will be required during laying of pipelines. After laying of rising and gravity main, roads will be restored in their original shape. As proposed alignment of rising and gravity main is vacant, unused, hence no involuntary resettlement impact is anticipated during pipelaying and restoration of roads.	

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

122. 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.

123. 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/throughput, waste production, discharge specifications, pollution sources and ancillary services;
(iii) 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; and
(iv) Operation and maintenance (O and 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.

124. 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).

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

126. In the case of this project (i) most of the individual elements are relatively small and involve straightforward construction and operation, so impacts will be mainly localized and not greatly significant; (ii) negative impacts associated with drainage facilities such as odour, treated wastewater discharge are already considered in design / siting of facilities, (iii) most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving excavation and earth movements; and (iv) being located in an urban area, will not cause direct impact on biodiversity values. The project will be in properties held by the local government and access to the project location is through public rights-of-way and existing roads hence, land acquisition and encroachment on private property will not occur. Appendix 8 provides Integrated Biodiversity Assessment Report (IBAT analysis) for Ratangarh.

B. Location and Design phase Impacts

127. **Distance from Protected Areas**: There are no protected areas or locations of any ecological interest at or near any of the work sites, so it is unlikely that the construction process will have any ecological impacts. The Nearest protected area is Tal Chhapar Sanctuary, which is about 33 km (aerial distance in south-west) of Ratangarh town. Screening of project areas is carried out based on Integrated Biodiversity Assessment Tool (IBAT) and IBAT proximity area report shows that there is no protected or key biodiversity area within 10 km of Ratangarh.

128. There are no ASI or state protected monuments within the project influence zone. The nearest ASI monuments is Harshnath Temple on Harsh Hill in Sikar at 83 km distance in south-east direction, and the nearest state protected monuments is Fatehpur Fort in Fatehpur Town at 32 km distance in south-east direction.

129. Impacts due to location – in Forest land. One disposal point along with raw water reservoir are proposed in Forest land. Raw water line from Main Ginani to Raw Water Reservoir is proposed within ROW of roads including those belonging to Nagar Palika-Ratangarh and dirt road under forest department ownership. Hence, Nagar Palika will obtain requisite permission from the Forest Department. A total of 0.15 ha of Forest land in the protected forest land " Kasba Ratangarh Forest" will be required. The forest land conversion will follow the "Guidelines for Diversion of Forest Lands for non-Forest Purpose" under the Forest (Conservation) Act, 1980. However, as most of the individual elements are relatively small no impact on forest ecosystems is envisaged. The pipelines will be laid along the existing roads and within the right of way with no notable tree felling envisaged as per design. There will no impact on trees existed on surrounding. The required area for actual construction are open and there are no tree are observed, Therefore no tree cutting for this subproject. However, it will be finalised during detailed design period and If any tree felling is required, compensatory tree plantation will be carried out in 1:3 ratio.

C. Pre-construction Impacts

130. **Utilities.** Telephone lines, electric poles and wires, water lines, gas pipe lines within the proposed project locations may require to be shifted in few cases. To mitigate the adverse impacts due to relocation of the utilities, the contractor, in collaboration with ULB will-

- identify the locations and operators of these utilities to prevent unnecessary disruption of services during construction phase;
- take prior permission from/intimation to concerned line agencies for shifting the existing utilities; and
- Instruct construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.

131. **Site selection of construction work camps, stockpile areas, storage areas, and disposal areas.** Construction work camps, stockpile areas, storage areas and disposal sites to be considered so that identified sites should not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems. Residential areas will not be considered for setting up construction camps to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust and noise and to prevent social conflicts, shortages of amenities and crime). Extreme care will be taken to avoid disposals near forest areas, water bodies, swamps or in areas which will inconvenience the community. Construction sites will be selected by contractor in compliance with these conditions and the same will be reflected in Site Environmental Management Plan (SEMP) which is to be prepared by contractor prior to start of construction and approved by PIU.

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

133. **Handling and Disposal of accumulated Solid Waste at proposed SWPS Sites**. As stated earlier, the selected low-lying lands for storm water pumping stations are filled with wastewater and solid waste, which needs to be cleared for construction of pumping stations. Site clearance and removal of solid waste is part of the scope of DBO contract. The handling of this accumulated waste will involve occupational health and safety issues to the workers engaged for such work and also to the people residing close to the work site. This is because the waste handling and working conditions will be harmful and may also emit harmful gases. Proper health and safety precautions are necessary. Following measures are to be implemented during the handling/ transfer of solid waste and site clearance:

- Prepare a waste handling and management plan for the work, considering handling, disposal and occupational and public health safety;
- Assess the working conditions, develop appropriate working method, and work shall be only conducted under continuous supervision of EHS supervisor;
- Waste shall not be handled manually; use appropriate equipment;
- All workers shall be provided with necessary personal protection equipment, including gloves, boots, face/gas masks. and oxygen cylinders in handy for emergency use etc.; if gas emission is suspected at any point of time, workers shall use gas masks with oxygen cylinders;
- Inform surrounding public about the work;
- Fire control and safety equipment shall be provided at the work site;
- Waste shall be properly covered during transport; and
- Manage the solid waste as per the Solid Waste Management Rules, 2016

134. **Debris and Silt disposal.** Prior to the commencement of works, contractor shall identify a debris disposal site in consultation with the PIU and Consultant. Contractor will follow all the prescribed rules[8]during construction and adhering to following criteria (including but not limited to)-

- The site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, top-soil stripping, stacking and preservation should be undertaken prior to initiation of any activities.
- The local governing body and community shall be consulted while selecting the site.
- Contractor shall prepare a construction and demolition waste management plan in pre-construction phase for safe disposal of construction and demolition wastes as per applicable rules and submit to Municipality through PIU for approval
- Debris disposal site shall be at least 200 m away from surface water bodies[9].
- No residential areas shall be located within 100 m downwind side of the site.
- The site is minimum 250 m. away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies.

135. **Presence of asbestos containing material (ACM) and Management.** Presence of Asbestos Containing Material (ACM) in the form of asbestos cement pipes in the existing drainage underground pipeline infrastructure is a cause of concern due to its potentially hazardous nature. Project, however, do not include rehabilitation or repair of AC pipes, and the project, in fact, designed to discontinue the use of AC pipes. Presence of AC pipes in the existing facilities may create hazardous conditions for the workers and surrounding community. Besides, the generation and disposal of debris and discarded materials, and construction phase health and safety need to be considered and mitigated to comply with the SPS provisions.

136. Most of the AC are old. There is no use of new AC pipes but for repairing work in the existing network, and for replace the damaged sections, AC pipes are being used. There will be no use of any AC pipe in the future as under the present project, drainage network is being provided in the entire town with non-AC pipes. It is normal practice in Rajasthan that existing AC

[8]Construction and Demolition Waste Management Rules 2016

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

pipes are left as it is in the ground and new pipes will be laid in a new alignment. As per the discussion with the local drainage pump house operator staff in Ratangarh, existing AC pipes are laid long back, they are deep in ground, more than 2 m at many places, as the road level has raised considerably. In wider roads, there will be adequate space to lay the new pipelines, and therefore there is no need to remove the existing pipelines.

137. Bureau of Indian Standards (BIS) Guidelines for Safe Use of Products containing Asbestos states that "Asbestos cement products (such as AC pipes) generally contain about 10-15% asbestos fibers in a cement matrix that comprises the rest of the materials and are termed as locked in asbestos products as these products have the asbestos fibers bound in cement. There is very little possibility of generation of airborne asbestos fibers during any reasonable handling, storage, and use of such products. However, during storing and installation, recommended work practices shall be followed to avoid harmful exposure". According to Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, any waste having asbestos concentration limit of 10,000 mg/kg (i.e. 1%), however this will apply only if the asbestos containing substances are in a friable, powdered or finely divided state. Under the Basel Convention10, asbestos or asbestos waste in the form of dust and fibers is classified as hazardous waste.

138. Working with or handling AC pipes in manner that produces dust, fibers, air borne particles etc., is very harmful and hazardous to the workers and general public around the work sites. The condition of existing underground AC pipes is not known, however, as these are old, pipes may be in deteriorated conditions. Condition needs to be assessed to check whether it is in friable form or in a condition in which it can release fibers before it is subjected any disturbance or removal.

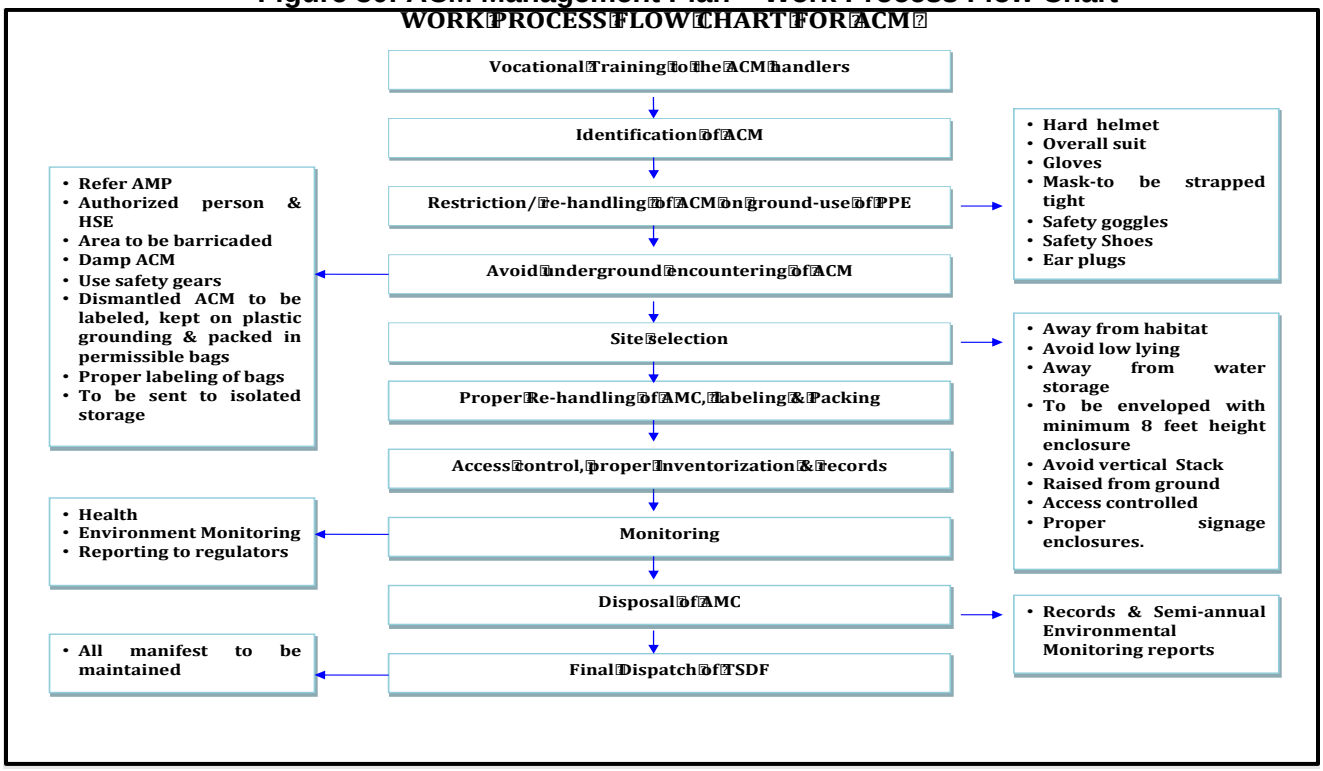
139. During the IEE preparation, an expert on Asbestos and ACMs was mobilized to assist PMU to conduct an assessment and field validation of the extent of asbestos cement materials covered under the RSTDSP subprojects. The assessment has indicated that specific measures are necessary to safeguard the health and safety of the nearby communities and the potential contractors consistent with the requirements of the ADB SPS 2009. Activities such as clearing, transfer and disposal of AC pipes, work in narrow streets, and interventions in existing AC pipes may have adverse impacts on workers and surrounding population. Air borne asbestos if handled unsafely, cut, drilled or broken into pieces that may cause health issues such as Inflammation of the lungs, Mesothelioma, Peritoneal mesothelioma, Pleural plaques, Asbestosis and Bronchogenic Carcinoma. Following measures are to be implemented to avoid any impacts:

- Develop and implement the ACM Management Plan (AMP) that includes identification of hazards, the use of proper safety gear and disposal methods. Sample AMP is provided in Appendix C-15. Adhere to the workflow process suggested in Figure 30.
- 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
- Identify risk of intervention with existing AC pipes. If there is significant risk, implement the AMP strictly that includes identification of hazards, the use of proper safety gear and disposal methods.

[10] Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, adopted in 1989.

- Appropriate actions as defined in the Asbestos Management Plan will have to be adhered to **Maintain records of AC pipes as per the AMP**

Figure 30: ACM Management Plan – Work Process Flow Chart



140. Requirement for the Contractor and the Subcontractor. The following are operational requirements related to works involving asbestos:

(v) Engaging certified and competent asbestos service provider to identify, handle and remove the asbestos materials present and encountered in the project sites;

(vi) Adopting good practices per EHS Guidelines [11] to minimize the health risks associated with asbestos materials by avoiding their use in new construction and renovation, and, if installed asbestos-containing materials are encountered, by using internationally recognized standards and best practices to mitigate their impact;[12]

[11] ADB SPS specifies application of pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's *Environment, Health and Safety (EHS) Guidelines.* These standards contain performance levels and measures that are normally acceptable and applicable to projects. When host country regulations differ from these levels and measures, the borrower/client will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the borrower/client will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in this document.

[12] The EHS Guidelines specify that the use of ACM should be avoided in new buildings and construction or as a new material inremodeling or renovation activities. Existing facilities with ACM should develop an asbestos management plan that clearly identifies the locations where the ACM is present, its condition (e.g., whether it is in friable form or has the potential to release fibers), procedures for monitoring its condition, procedures to access the locations where ACM is present to avoid damage, and training of staff who can potentially come into contact with the material to avoid damage and prevent exposure. The plan should be made available to all persons involved in operations and

(vii) training of workers and supervisors, possession of (or means of access to) adequate equipment and supplies for the scope of envisioned works, and a record of compliance with regulations on previous work;

(viii) removal, repair, and disposal of ACM shall be carried out in a way that minimizes worker and community asbestos exposure, and require the selected contractor to develop and submit a plan, subject to the PMU and PIU's acceptance, before doing so;

(ix) providing adequate protection to its personnel handling asbestos, including respirators and disposable clothing;

(x) notifying the Rajasthan State Pollution Control Board (RSPCB) of the removal and disposal according to applicable regulations as indicated in the technical requirements and cooperating fully with representatives of RSPCB during all inspections and inquiries.

141. PMU will engage an Asbestos Management Specialist to provide training and awareness, and to coordinate with various stakeholders on the risks, management, and mitigation measures required for the identification, safe handling, transport and disposal of the asbestos materials. Contractor will be instructed to not to remove any AC pipes if encountered and remain in-situ and lay new line parallel to it.

D. Construction Impacts

142. Although construction of these project components involves quite simple techniques of civil work, the invasive nature of excavation and the project locations in the built-up areas of the town where there are a variety of human activities, will result in impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. The anticipated impacts are temporary and for short duration. A detail survey is needed after finalization of alignment to access the feasibility of the alignment for need of any tree cutting, demolition of any structure, road crossings, construction in any private land, presence of any sensitive receptor along alignment, disturbance to public or business etc. Mitigation measures have been prepared for potential adverse impacts. Prior consent and NOC from land owners (e.g. PWD, ULB etc.) from concerned departments prior to start of construction works, is required.

143. Physical impacts will be reduced by the method of working and scheduling of work, whereby the project components will be (i) constructed by small teams working at a time; (ii) any excavation done near sensitive area like school, religious places and house will be protected as per standard norms etc (iii) finish excavation and construction works at earliest in a strech (iv) provide adequate barricades and road safety signage during proposed works in traffic areas (v) Further if night works are required (however unlikely, applicable only in extreme conditions) all the mitigation measures to reduce impacts of disturbance to minimum level to nearby habitants and road users should be ensured by contractor.

144. **Storage and Disposal of excavated earth and silt.** A large quantity of soil and silt will be excavated for construction/strengthening of drains. Some part of this excavated soil will be

maintenance activities. Repair or removal and disposal of existing ACM in buildings should be performed only by specially trained personnel following host country requirements or, if the country does not have its own requirements, internationally recognized procedures. Decommissioning sites may also pose a risk of exposure to asbestos that should be prevented by using specially trained personnel to identify and carefully remove asbestos insulation and structural building elements before dismantling or demolition.

reused for construction of embankments and/or surface leveling; rest of the soil will need to be disposed in other locations. Proper storage and disposal plan from contractor is required before start of the work. Prior permission from land owner/concerned authority for storage and disposal of excess earth is required. Prior to the commencement of works, Contractor will follow all the prescribed rules[13] and shall identify a soil/debris disposal site in consultation with the PIU/ULB and adhering to following criteria:

- The site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, top-soil stripping, stacking and preservation should be undertaken prior to initiation of any activities.
- Debris disposal site shall be at least 200 m away from any surface water body.
- No residential areas shall be located within 200 m downwind side of the site.
- The site is minimum 250 m. away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies.
- The local governing body and community shall be consulted while selecting the site.
- 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 to be approved by Municipal Council as per Construction and Demolition Waste Rules 2016
- Soil storage site should be properly demarcated by fencing and information board should be placed at entrance
- 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

145. Silt and sludge removal is regular activity conducted by ULB every year before start of monsoon. The Provision are considered in BOQ for silt and sludge clearance from proposed drains. As the silt is mixed with the water, handling and transport of silt/sediment in semi-solid / slurry form will lead to spillage of contaminated water/slurry. Accumulated drain water with silt/sediment, potentially mixed with solid waste / wastewater in some places, may present hazardous conditions for removal of sediment/silt. Following measures are suggested to safely desilt and dispose the desilted material:

- Desilting process of shall be conducted in dry season only
- Prior to desilting process, the drains shall be allowed dry so that there is no standing water on silt / sediment
- Do not conduct manual desilting process, use appropriate equipment / implements
- Desilting process shall be conducted in such a way that water content of the silt/sediment is low, so that contaminated water is not spilled during the loading, transport and unloading process.;
- Workers shall be provided with appropriate PPE's; masks with oxygen cylinders shall be made available at the site, which shall be utilised during emergency
- identify beneficial uses or dispose at suitable disposal site in consultation with the PIU/ULB:

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

[13] Construction and Demolition Waste Management Rules 2016 and Solid Waste Management Rules

- Use material sources permitted by government[14];
- Verify suitability of all material sources and obtain approval of PIU;
- Ensure that the loading and unloading of the materials and the transportation of the materials from source to construction site does not cause impact on health and safety of the workers and the community; and
- Submit to PIU on a monthly basis documentation of sources of materials. . If contractor is purchasing ready mix concrete, asphalt/macadam and aggregates from third party, contractor will assure that all the parties/ suppliers are having CTE/CTO from RSPCB and will collect the copy of these certificates and submit to PIU/consultants

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

- Consult with PIU/on the designated areas for stockpiling of soils, gravel, and other construction materials;
- Damp down exposed soil and any stockpiled material on site by water sprinkling;
- Use tarpaulins to cover sand and other loose material when transported by trucks;
- Clean wheels and undercarriage of haul trucks prior to leaving construction site
- Don't allow access in the work area except workers to limit soil disturbance and prevent access by barricading and security personnel
- Fit all heavy equipment and machinery with air pollution control devices which are operating correctly, DGs should have proper stake height as per norms;
- Ensure all the equipment are having PUC certificates
- Do regular water sprinkling in dusty areas to reduce dust emission during works
- Damp down the structures before demolishing to reduce dust emission
- Damp down on regular basis all the access ways
- Maintain all the equipment and vehicles to reduce emission of smoke and keep pollution under control and keep records of periodic maintenance
- Conduct ambient air quality monitoring periodically as per Environmental Management Plan EMP

148. **Surface Water Quality.** There is no any surface water source near the proposed site, which can be polluted due to construction activities, however there are 6 nos. depression point where storm water is stored by gravity in monsoon season. So there are temporary water storage places. Storm water run-off from stockpiled materials and chemical contamination from fuels and lubricants during construction works can contaminate the drainage e system of town. These potential impacts are temporary and short-term duration only. However, to ensure that these are mitigated, construction contractor will be required to:

- Prepare and implement a spoils management plan;

[14]CTE and CTO will be required for batching plant, hot mix plant, crushers etc. if specifically established for this project. If contractor is purchasing raw material or ready mix concrete, asphalt/macadam and aggregates from third party, he has to be assured that third party is having CTE/CTO from RSPCB and should collect the copy of these and submit to PIU/consultants. Quarry sites should also have the desired permissions.

- Avoid to construct any construction camps and labour camps near to any water body and do not allow to dispose any waste or sullage in to any water body
- 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, consult with PIU on designated disposal areas;
- 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 and provide impermeable lining under the storage yard of fuels and lubricants
- Dispose any wastes generated by construction activities in designated sites;
- Keep oil tray or pans under the DG set or during maintenance of mechanical equipment to avoid oil spillage resulting soil and water pollution, and
- Conduct surface water quality Monitoring according to the Environmental Management Plan (EMP)

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

- Plan activities in consultation with PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;
- Use road cutters instead of breaker/hammer for cutting the road before excavation on roads
- Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach;
- 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;
- DGs being used at site should have sound reducing (acoustic) enclosures, preferably silent DGs should be used at site;
- Maintain maximum sound levels not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s and equipment;
- Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity;
- Consult the custodians of important buildings, cultural and tourism authorities and local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals, exams of students etc.;
- Provide all workers appropriate PPEs like ear plug/muff, working in high noise conditions;
- Keep all vehicles and equipment in good conditions to avoid excessive noise generation;

- Provide noise barriers near sensitive receptors like schools, hospitals, temples, courts etc and consult in advance with sensitive receptors about the working hours (specially schools, hospitals, offices, courts etc) and avoid noisy works in those hours;
- Avoid noisy works in nights in inhabited areas to avoid any disturbance to habitants; and
- Consult in advance with habitants and inform them about the nature and duration of works
- Conduct noise monitoring according to the Environmental Management Plan (EMP)

150. **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.
- Contractor should plan for night works only after directions from PMU/PIU/CMSC
- Contractor should submit plan for night works for approval from PIU.
- PIU should ensure that prior written information should be given to local authorities such as district administration, Police/traffic police, line agencies concerned, resident's welfare association/business association/vyapar of the affected areas and their consents/permissions should be taken prior to start of night works.
- PIU/CMSC engineers should check and ensure that all the preparation as per management plan is done by contractor and contractor is having all the necessary equipment and materials for night works.
- Contractor is required to have following equipment/arrangements for night works-
    - ✓ Contractors should have hand held noise level meter for measurement of noise during night hours
    - ✓ Contractors should have hand held lux meter for the measurement of illumination during night hours
    - ✓ 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/CMSC 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
- Night works should not be conducted near hospitals and during peak seasons such as peak tourist season, students' exam times etc.

151. **Landscape and Aesthetics.** The construction works may require cutting of trees and also will produce excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items. Unplanned disposal of these will have negative impacts on Landscape and overall aesthetics. These impacts are negative but are of short-term and reversible by mitigation measures. The construction contractor will be required to:

- Prepare and implement spoils management plan;

- Avoid stockpiling of excess excavated soils;
- Coordinate with ULB for beneficial uses of excess excavated soils or immediately dispose to designated areas;
- Recover used oil and lubricants and reuse or remove from the sites;
- Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
- Minimize removal of vegetation and minimize cutting of trees;
- If tree-removal will be required, obtain tree-cutting permit from the Revenue Department; and
- Plant three native trees for every one that is removed.
- Remove all wreckage, rubbish, or temporary structures which are no longer required; and
- Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.

152. **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. Although, groundwater is much deeper than the proposed trenching depth, and rains are scarce and limited to very short duration during monsoon, to ensure that water will not pond in pits and voids near project location, the construction contractor will be required to conduct excavation works in non-monsoon season to the maximum extent possible. These potential impacts are temporary and short-term duration only. However, to ensure that these are mitigated, construction contractor will be required to:

- Prepare and implement a spoils management plan (**Appendix C-13**);
- 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, consult with PIU on designated disposal areas;
- 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;
- Dispose any wastes generated by construction activities in designated sites; and
- Conduct periodical ground water quality monitoring according to the Environmental Management Plan (EMP).

153. **Accessibility.** Excavation along the roads, hauling of construction materials and operation of equipment on-site can cause traffic problems. Considering limited availability of ROW and community safety on rural area at SWPS, and Disposal Points sites. During construction traffic on these roads will require diversion and temporary closer. Potential impact is negative but short term and reversible by mitigation measures. The construction contractor will be required to:

- Prepare and implement a Traffic Management Plan **(Appendix C-14**)
- 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;
- Keep the site free from all unnecessary obstructions;

- Drive vehicles in a considerate manner;
- Coordinate with Traffic Police for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours; and
- Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.
- Excavated roads to be wetted through water sprinkling to reduce dust emission
- Providing and fixing Barricading using 40 mm dia M.S. pipe vertical and horizontal posts
- Providing and fixing OPEN including strutting, shoring and packing cavities (wherever required)
- Providing and fixing CLOSE timbering including strutting, shoring and packing cavities (wherever required)

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

- Prepare and implement spoils management plan (**Appendix C-12**);
- 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; and
- 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.
- Provide all mitigation measures as given in resettlement plan (RP) prepared for the project to mitigate impacts on vendors and shopkeepers

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

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

156. **Occupational Health and Safety.** Workers need to be mindful of the occupational hazards which can arise from working on roads, in height and excavation works. Potential impacts are negative and long-term but reversible by mitigation measures. Construction contractor will depute experienced EHS personnel and will be required to:

- Comply with all national, state and local labor laws (see **Appendix C-12**);
- Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b)ensuring all workers

are provided with and use personal protective equipment;(c) OH&S Training[15] for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;

- Ensure that qualified first-aid is provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;
- Provide medical insurance coverage for workers;
- Secure all installations from unauthorized intrusion and accident risks;
- The project area experiences extreme temperature during summer months of April and May, which may affect the health of workers engaged in construction work. Contractor should take necessary measures during summers including the following:
    a. Work schedule should be adjusted to avoid peak temperature hours (12 -3 PM)
    b. Provide appropriate shade near the work place; allow periodic resting and provide adequate water
    c. Provide necessary medicine and facilities to take care of dehydration related health issues
- Provide supplies of potable drinking water;
- Provide clean eating areas where workers are not exposed to hazardous or noxious substances.
- Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;
- Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;
- Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
- Ensure moving equipment is outfitted with audible back-up alarms;
- Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and
- 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.
- Adapt site-specific health and safety measures; sites/facilities at the existing pumping stations present harmful conditions for the workers due to accumulated wastewater and solid waste, proper measures shall be implemented

157. **Asbestos Containing Materials**. No ACM is proposed to be used in the subproject construction. However, In the existing underground pipe networking of drainage system approx. 5410 m of rising mains at three SWPS are of AC materials, which may be disturbed or come in contact with the workers and general public and may have serious health implications. This is

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

already discussed under heading **Pre-construction Impacts**, and necessary measures are suggested. The drainage sib-project Project, however, do not include rehabilitation or repair of AC pipes, and the project, in fact, designed to discontinue the use of AC pipes.

158. **Community Health and Safety.** Hazards posed to the public, specifically in high-pedestrian areas may include traffic accidents and vehicle collision with pedestrians. Potential impact is negative but short-term and reversible by mitigation measures. Considering limited availability of ROW and community safety on rural area at Saraf Sump Well, Near Railway Quarter and Parmana Taal. Underground rising main are proposed in these area. The construction contractor will be required to:

- Plan routes to avoid times of peak-pedestrian activities.
- Liaise with PIU in identifying risk areas on route cards/maps.
- 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.
- Survey the surrounding vulnerable buildings for likely issues in structural stability/ differential settlement during the excavation works;
- Provide prior information to the local people about the nature and duration of work;
- Provide hard 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.
- Do not park heavy construction machinery on roads
- Avoid storing excavated material on road.

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

- Consult PIU before locating project offices, sheds, and construction plants;
- Minimize removal of vegetation and disallow cutting of trees;
- Provide drinking water, water for other uses, and sanitation facilities for employees;
- Provide temporary rest and eating area at all work sites;
- Ensure conditions of liveability at work camps are maintained at the highest standards possible at all times; 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 used as accommodation for workers; accommodation shall meet the IFC standards for workers accommodation[16] which include: provision of safe housing, availability of electricity, plumbing, water and sanitation, adequate fire protection and dormitory/room facilities; accommodation shall be in the range from 10 to 12.5 cubic meter (m3) (volume) or 4 to 5.5 square meters (m2) (surface) per worker, a minimum ceiling height of 2.10 m; a reasonable number of workers are allowed to share the same room–(standards range from 2 to 8 workers); workers with accompanying families shall be provided with a proper and safe accommodation (Suggested guidelines based on IFC benchmark standards for workers accommodation is provided in **Appendix C-21**);

16 https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_gpn_workersaccommodation

- Prohibit employees from poaching wildlife and cutting of trees for firewood;
- Train employees in the storage and handling of materials which can potentially cause soil contamination;
- Recover used oil and lubricants and reuse or remove from the site;
- Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
- Remove all wreckage, rubbish, or temporary structures which are no longer required; and
- Report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.

160. **Social and Cultural Resources.** For this project, excavation will occur at locations not known to have archaeological values, so there is no risk of such impacts. Religious places such as temples are present nearby the proposed alignment of drains and contractor will require to follow the mitigation measures as given below-

- Consult with concerned religious authorities, nearby people and devotees in pre-construction phase and explain the work method and duration of proposed works, take their suggestions and comments and incorporate in design the mitigation measures required
- Adjacent to religious/social/historic sites, undertake excavation and construction work in such a way that no structural damage is caused to the religious building.
- 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.

161. **Physical Cultural Resources.** There are no notable or significant archeological places or protected monuments or areas in Ratangarh subproject area. Therefore, no impacts envisaged but risk of uncovering archeological remains, given the long history of town, during the excavations cannot be ruled out completely. Construction 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 / Museum office if a find is suspected and take any action, they require to ensure its removal or protection in situ; and
(iv) Prepare a chance find protocol (**Appendix C-26**)

162. The nearest ASI monuments is Harshnath Temple on Harsh Hill in Sikar at 83 km distance in south-east direction, and the nearest state protected monuments is Fatehpur Fort in Fatehpur Town at 32 km distance in south-east direction.

163. **Traffic diversion and/or road closure-** If traffic diversion and/or road closure is required for the proposed works, prior consent from traffic department will be required and prior information to affected areas and public should be disseminated through consultations by CAPC. Proper road signage and traffic aids should be provided at site. Excavation along the roads, hauling of construction materials and operation of equipment on-site can cause traffic problems. Potential

impact is negative but short term and reversible by mitigation measures. The construction contractor will be required to:

- Prepare and implement a Traffic Management Plan
- 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;
- Keep the site free from all unnecessary obstructions;
- Drive vehicles in a considerate manner;
- Coordinate with Traffic Police for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours; and
- Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.
- Maintain sufficient access to houses and shopkeepers (commercial establishments) during construction work through metal sheets and temporary bridges
- Locate entry and exit points in areas where there is low potential for traffic congestion;

E. Operation and Maintenance Impacts

164. **Proposed Drainage System:** The system have a design life of 15/30 years, during which shall not require major repairs or refurbishments and should operate with little maintenance beyond routine actions required to keep the system 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 and repairing.

165. Regular cleaning of drains, specially before start of monsoon season is required to avoid any blockage and overflow of drains, which may ultimately create public nuisance such as ponding in nearby places. Identify the suitable place for disposal of silt and solid waste, away from habitation and dispose the silt and solid waste after cleaning of drains; in a scientific manner so that it may not cause public nuisance or any harm to stray animals.

166. The new pipelines, new pumping station at existing system are proposed which will contribute to an improvement in the physical appearance and condition of the town by helping to remove the large and unsightly pools of water that are an almost permanent feature of the town. Removal of blockages in the Nalas and other drains, if left stockpiled alongside the drains, will have adverse impacts on the appearance of the area. Not only is this unhygienic, but it is also inefficient, as much of this material inevitably returns to the drains, where it may cause further blockage.

167. **Project Benefits.** The citizens of the Ratangarh town will be the major beneficiaries of the improved drainage system, as the unsightly and unhygienic pools of standing wastewater will gradually disappear and should not recur in future. This should then improve the appearance and environment of the town, as well as protecting the ancient buildings and sites from the water damage they are exposed to at present. If, as expected, this ultimately brings more tourists into the town, then the citizens could benefit socio-economically from the related growth in the economy apart from improved environmental conditions of city.

VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Overview

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

169. A three-tier consultation process has been adopted for RSTDSP project: focus group discussions, primary household sample surveys and a town-level public consultation workshop. Most of the main stakeholders have already been identified and consulted during preparation of preliminary design and IEE, and any others that are identified during project implementation will be brought into the process in the future. Primary stakeholders of the subproject are: residents, shopkeepers and businesspeople who live and work alongside the roads in which network improvements will be provided, and government and utility agencies responsible for provision of services, Ratangarh Nagar Palika, Public Health Engineering Department, Rajasthan Forest Department Revenue Department and district collector Churu. Secondary stakeholder are: NGOs and CBOs working in the area, community representatives, beneficiary community in general, government agencies, the executing and implementing agencies (LSGD and RUDSICO-EAP), Government of India and the ADB.

B. Public Consultation

170. The public consultation and disclosure program is a continuous process throughout the project implementation, including project planning, design and construction. Informal and formal consultations at different locations were also conducted during social and environmental impact assessment in Ratangarh.

1. Consultation during Project Preparation

171. Informal and formal consultation are conducted with local population of the area, about at 10 places along with proposed alignment with about 102 persons (79 male and 23 females) from 05.05.20022 to 06.05.2022, 25.07.2022 to 26.07.2022 and 10.08.2022. Discussions were held about proposed project components, EMP measures, ownership of land, tree cutting, water logging problems and general people perception for proposed project. Project information was given to participants and their suggestions and comments were enquired about. People were agreed with proposed drainage works as they were suffering with poor drainage conditions in these locations. It was noted that people are willing to extend their cooperation as the proposed activities are supposed to enhance the environmental conditions and the living standard of the public. The public expressed their concern regarding the nuisance and disturbance (dust, road closure and traffic management activities) during the construction stage which can have impact on their day to day activities. Public opined that an appropriate operation and maintenance system should be in place, for proposed drainage system, for its best functioning and to have the maximum health and aesthetic benefits.

172. Focus-group discussions with residents and other stakeholders were conducted to learn their views and concerns. A social and environmental impact assessment has been conducted in

the town, covering sample households and nearby vendors to understand the basic characteristics of town, health status, and the infrastructure service levels, and also the demand for infrastructure services.

173. A town-level City Level Committee (CLC) has been formed in Ratangarh Town by Government orders. City Level Committee meeting was organized during the detailed design stage to which representatives of primary and secondary stakeholders were invited. City Level Stakeholder committee meeting was organized for Ratangarh Town at District Head Quarter "Churu" on dtd. 20.05.2022 to discuss the matter of proposed Drainage works in Ratangarh under the chairmanship of District Collector (Churu) and in presence of Members of Legislative Assembly in Ratangarh , DPR consultants, RUDSICO-EAP officials, PHED officials, Nagar Palika Officials, Water Resource Department, PWD and other invitee members. Proposed scope of works and technology of proposed drainage works in Ratangarh was discussed in this meeting and approval was given for proposed works by Committee in this meeting. The project was agreed by the committee for further course of action by RUDSICO-EAP. Details of CLC meeting, minutes and photographs are attached in **Appendix 4**.

174. A Meeting was arranged with Forest Range Office, Ratangarh and discussion about forest area distribution in Ratangarh and presence of forest area at proposed subproject component locations : Rising Main Pipe laying from SWPS-4 to Disposal Point 3. This forest land is protected forest (Kasba Ratangarh forest) land. Proposed Rising Main line (from SWPS 1&2 to Disposal Point -1) crosses the notified protected forest existed along NH-52 (Old No. NH-11) near the railway under pass. Road side Plantation of NH-52 (Old No. NH-11) is declared as notified Protected Forest. Thus, forest diversion is applicable for proposed SWPS-4, Disposal Point 3, Rising Main Pipe Line from SWPS-4 to Disposal Point No. 1 and NH-52 crossing near railway under pass (Ratangarh) etc.

2. Consultation During Construction

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

176. A constant communication will be established with the affected communities to redress the environmental issues likely to surface during construction and operational phases and also regarding the grievance redress mechanism. PIU with the help of Community Awareness and Participation Consultant (CAPC) will organize public meetings and will appraise the communities about the progress on the implementation of EMP. Meeting will also be organized at the potential hotspots/sensitive locations before and during the construction.

C. Information Disclosure

177. Executive summary of the IEE will be translated in the local language and made available at the offices of JoDA/JMC, RUDSICO-EAP- PMU and PIU. Copies of summary will be provided to participants of city level workshop to be organized in Ratangarh . Hard copies of the IEE will be accessible to citizens as a means to disclose the document and at the same time creating wider public awareness. Electronic version of the IEE in English and Executive Summary in Hindi

will be placed in the official website of the Nagar Palika Ratangarh/JMC/RUDSICO-EAP after approval of the IEE by Government and ADB. Stakeholders will also be made aware of grievance register and redress mechanism.

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

179. 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

A. Project Specific Grievance Redress Mechanism

180. A project-specific, three-tier grievance redress mechanism (GRM) covers both environment and social issues. The GRM will be established to receive, evaluate, and facilitate the resolution of affected persons' concerns, complaints, and grievances about the social and environmental performance at project level. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns related to the project. Assessment of the GRM designed and implemented for Rajasthan Urban Sector Development Program (RUSDP)[17] the system was effective in timely resolution of grievances in a transparent manner.[18] The multichannel, project-specific, three-tier GRM is functional at RUSDP, hence the design of GRM for RSTDSP takes into account the proposed institutional structure for RSTDSP and the positive features and learnings from the previous GRM.[19]

181. **Common Grievance Redress Mechanism.** A common GRM will be in place for social, environmental, or any other grievances related to the project. Implementation of the resettlement

[17] The procedures followed for grievance redress during implementation of RUSDP Phase III included the project GRM and the pilot GRM software application (smart check) in Pali, the Sampark portal of Government of Rajasthan, and the Chief Minister's helpline. Complaints received through various channels were mostly minor and pertained to damage to existing water supply pipelines and disruption of water supply during construction, delays in road restoration, and pending new connections. Complaints related to damage to private property (compound walls/steps, etc.) were less in number. The grievances were mostly possible to resolve in coordination with the contractors. Complaints received were immediately referred by the CAPC/PMDSC supervision staff to the PIU Nodal officer (safeguards) and concerned engineer at PIU, who advised them on further action. Follow up with the contractor on complaint resolution was undertaken by PIU Nodal officer CAPC and PMDSC and final feedback sought from complainant upon resolution. Complaints requiring inter-departmental coordination were referred to the PMU for resolution, and feedback provided to complainant. The PMU kept regular track of grievances through WhatsApp and email alerts, ensuring registration and follow-up until resolution.

[18] Town-level grievance registration data indicates that a large number of grievances were registered, pointing to the effectiveness of the multi-channel GRM. No major grievance was received for RUSDP Phase III. The GRM helped smoothen the process of project implementation, hence the proposed architecture for the RSTDSP GRM remains similar, with some refinement, taking into account the changes in institutional setup proposed for project implementation.

[19] Continued logistics support at field level will be key to successful management of grievance redress under RSTDSP. The target date for establishment of the first level (PIU level) and second level (Zonal level) of GRM is before loan negotiation.

plans/RIPPs/DDRs/IEEs will follow the GRM described below. The GRM will provide an accessible and trusted platform for receiving and facilitating resolution of affected persons' grievances related to the project.

182. Public awareness campaigns within entire ULB/Municipal area will ensure that awareness on grievance redress procedures is generated. The nodal officer- social/environment at field level through community awareness and public participation consultant (CAPPC) will conduct ULB/Municipal area-based awareness campaigns to ensure that poor and vulnerable households are made aware of grievance redress procedures and entitlements. Contractors will provide pamphlets to communities prior to start of works and billboards during construction. The pamphlets and billboards will include relevant environmental and social safeguards, GRM information, and contact details of key personnel from PIU and contractors.

B. Grievance Redress Process

183. Affected persons will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaint/suggestion boxes that will be installed by project PIUs or by e-mail, by post, or by writing in a complaints register in ULB offices/complaints register at contractor's work site[20] or by sending a WhatsApp message to the PIU[21] or by dialling the phone number of town level PIU/CAPPC or by dialling a toll-free number.[22] Any aggrieved person can also avail the facilities of online grievance monitoring system 'Rajasthan Sampark' portal to register their grievances which are a parallel mechanism of grievance registration, in addition to the project GRM.[23] Careful documentation of the name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved will be undertaken and feedback provided to the complainant on action/decision taken. The Safeguard and safety officer of town/city level PIU will have the overall responsibility for timely grievance redressal on environmental and social safeguards issues and for registration of grievances, related disclosure, with the assistance of project consultants. In case of grievances that are immediate and urgent in the perception of the complainant, the contractor, and officials of PIU with assistance from CMSC and CAPPC on-site will provide the most easily accessible or first level of contact for quick resolution of grievances. Contact numbers and names of the concerned PIU safeguard and safety officer, contractors, CAPPC and CMSC personal will be posted at all construction sites at visible locations.

(i) **1st level grievance.** The contractors, PIU executive engineer/assistant engineer designated as safeguard and safety officer (social and environment), CMSC (safeguard staff) and CAPPC can immediately resolve issues on-site, in consultation with each other and will be required to do so within 7 days of receipt of a complaint/grievance. If required, city level monitoring committee (CLMC)[24] will be involved in resolution of grievances at the

[20] RUSDP piloted an online application based live GRM counter for resolution of public grievances over and above the usual process of grievance registration and redressal. This app based GRM - "RUIDP Smart Check" is available at Google play store (free of cost) and is operational. The RUIDP Smart Check "app" was launched in Pali town in July 2017 and is proposed to be scaled up in RSTDSP project towns. For persons without access to the application, the traditional channels will continue to be available.

[21] It is suggested for each PIU to have a dedicated WhatsApp group for registration of grievances and receipt of quick feedback, to be followed by more formal communication.

[22] Project contractors in all project towns will have a toll-free number with specific working hours for registration of grievances related to RSTDSP.

[23] http://www.sampark.rajasthan.gov.in/RajSamWelcome.aspx

[24] The CLMC has been formed at the town/city level for planning and monitoring of work, resolve issues related to departmental coordination etc. It is headed by Commissioner/Executive Officer ULB (Chairman) and city engineer of public health engineering department (PHED), public works department (PWD) and head of PIU acting as Member

1st level;

(ii) **2nd level grievance.** All grievances that cannot be redressed within 7 days at field/PIU level will be brought to the notice of Zonal PIU headed by Additional Chief Engineer (ACE).The ACE at zonal PIU will resolve the grievance within 7 days of receipt of compliant/grievance in discussion with the ASO, field level PIU, CMSC, CAPPC and the contractor; and

(iii) **3rd level grievance.** All the grievances that are not addressed by Zonal PIU within 7 days of receipt will be brought to the notice of the PMU. Depending on the nature of grievance, the project officer (social/environment) at PMU will resolve the grievance within 15 days of receipt of grievance with necessary coordination of Zonal PIU and CMSC and guidance/instruction of additional project director (APD-PMU).

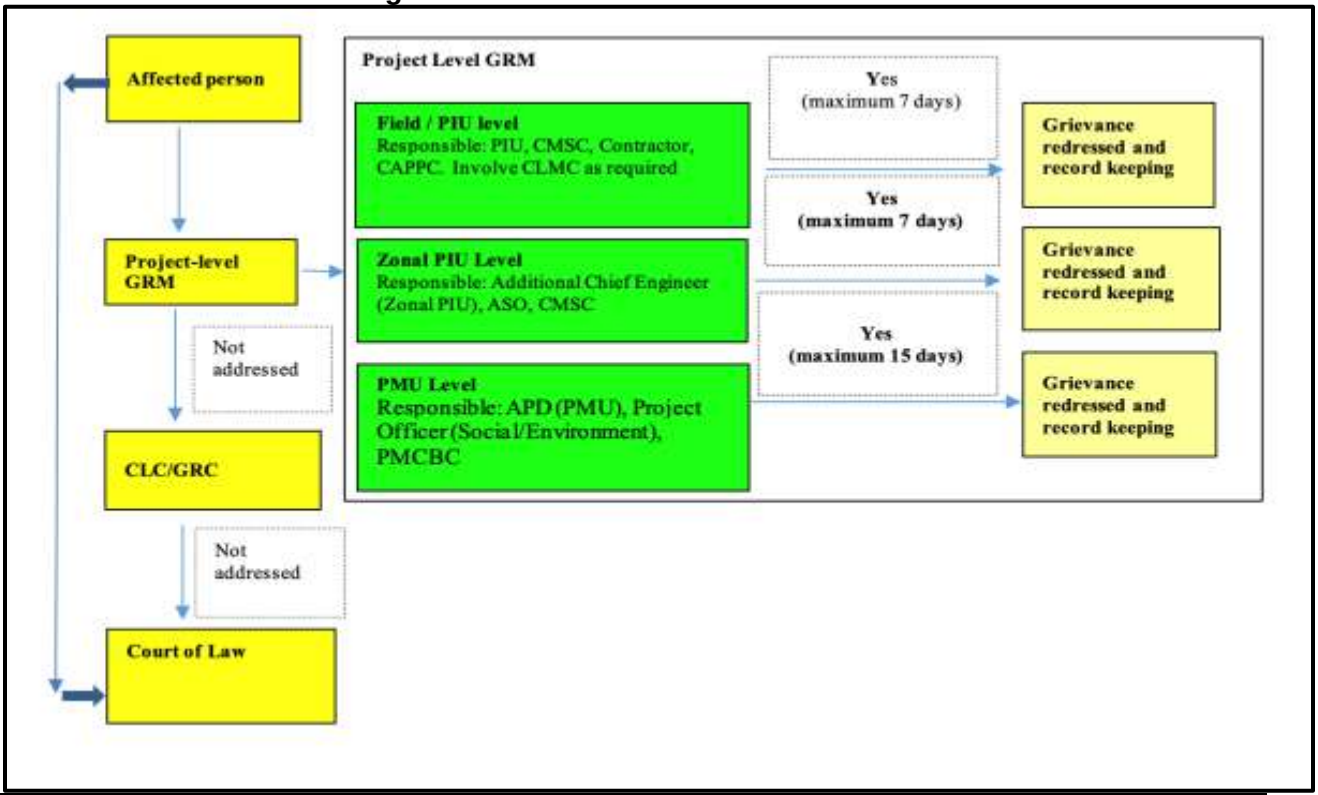
(iv) Grievances not redressed through this process within/at the project level within stipulated time period will be referred to the CLC/GRC, which has been set up.[25] In its role as a GRC, the CLC will meet whenever there is an urgent, pending grievance. Other grievances can be discussed during its regular meetings. Zonal PIU will inform the CLC regarding any grievances required to be resolved urgently. The GRC will resolve the grievance within 15 days of receiving the complaint. In case of any indigenous peoples impacts in subprojects, the CLC/GRC must have representation of the affected indigenous people community, the chief of the tribe or a member of the tribal council as traditional arbitrator (to ensure that traditional grievance redress systems are integrated) and an NGO working with indigenous people groups.

(v) The multi-tier GRM for the project is outlined below (**Figure 31**), each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required. The GRC will continue to function throughout the project duration.

Secretary.

[25] City Level Committee (CLC)/grievance redress committees (GRCs) has been constituted for each town/city under the Chairmanship of District Collector to provide overall subproject guidance and "to sort out issues and remove hindrances, if any". CLC formed at city-level/district level with members composed of: District Collector as Chairperson and following as members: ULB Commissioner/Mayor/Chairman; Deputy Mayor/Vice Chairman ULB; Chairman/Secretary Urban Improvement Trust (UIT); Head of Zonal/field level PIU as Member Secretary; one representative each from relevant government departments as appropriate (PWD/PHED/Town Planning Department etc.). All CLCs in their role as GRCs will have at least one-woman member/chairperson. In addition, for project-related grievances, representatives of affected persons, community-based organizations (CBOs), and eminent citizens will be invited as observers in GRC meetings. The concerned Member of Parliament (MP) and Member of Legislative Assembly are also part of the CLC.

Figure 31: Grievance Redress Process



APD = Additional Project Director, ASO = Assistant Safeguards Officer, CAPPC = community awareness and public participation consultant, CMSC = construction management and supervision consultants, CLC = city level committee, CLMC = city level monitoring committee, GRC = grievance redress committee, PIU = project implementation unit, PMU = program management unit, PMCBC = project management and capacity building consultant.

184. The project GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM. In case of grievance related to land acquisition, resettlement and rehabilitation, the affected persons will have to approach a legal body/court specially proposed under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCTLARRA), 2013.[26]

185. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make an effort in good faith to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.[27]

186. **Record-keeping.** The PIU of each town and PMU will both keep records of grievances received, including contact details of complainant, date the complaint was received, nature of

[26]The Authority admits grievance only with reference to the Land Acquisition and R&R issues under the RFCTLARRA, 2013.

[27] Accountability Mechanism. http://www.adb.org/Accountability-Mechanism/default.asp

grievance, agreed corrective actions and the date these were affected and final outcome. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PMU office, PIU offices, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis.

187. **Periodic review and documentation of lessons learned.** The PMU Project Officer (Environment) will periodically review the functioning of the GRM in each town and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

188. **Costs.** Contractors are required to allocated budget for pamphlets and billboards as part of the EMP. Costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the concerned PIU at town level while costs related to escalated grievances will be met by the PMU. Cost estimates for grievance redress are included in resettlement cost estimates.

189. Presently GRC in 14 ongoing project towns are functional as per RSTDSP's Grievance Redress Mechanism (GRM). Therefore 2nd and 3rd level GRC are already functional at Zonal PIUs (at Jaipur and Jodhpur) and PMU levels. PIU level GRC shall be formed in upcoming project towns after PIUs in new towns are established through office order from PMU for the same.

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

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

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

192. For civil works, the contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate budget for compliance with these EMP measures, requirements and actions.

193. Tables for Environment Management Plan during Design, Pre-construction, Construction and Operation phases are given below-

Table 13: Design Stage Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
Location impacts of proposed components	Nearby community may be affected due to increased pollution during construction and operation	(i) Work method should be prepared so that nearby community may have no or minimum impact due to proposed works (ii) Mitigation measures are prepared and included in design and EMP is attached with contract documents	List of pre-approved sites for -construction work camps, areas for stockpile, storage and disposal -Waste management plan	Consultants/PMU	No cost required
Requirement of tree cutting	Tree cutting may result loss of aesthetics and increase in air pollution	(i) project designs should be done so that minimum tree cutting is required (ii) project documents should include the minimum tree cutting provisions (iii) Provision for Compensatory plantations in 1:3 ratio should be included in contract documents	As per RUDSICO-EAP policy; Tree Cutting Approvals; Compensatory Afforestation Plan;	Consultants/PIU/PMU	No cost required
Energy Efficiency	Loss of natural resources	(ii) Use energy efficient electrical equipment (iii) Provision of use of energy efficient equipment in contract agreements and BOQ	As per BEE norms	Consultants/PMU	No cost required
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	EMP included in Bid Document	PMU	Project Costs
	Implementation of the Health and Safety measures by contractor	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.	EMP included in Bid Document	PMU	Project Costs
Preparation of plans and protocols	Various impacts	i) Preparation of ACM Management Plan (ii) Prepare traffic management plan (iii) Prepare occupational health and safety plan (iv) Prepare spoils management plan	EMP included in Bid Document	DBO Contractor and CMSC with the assistance of PMCBC (for ACM plan)	Project costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
Site preparation	Removal of solid waste and other nuisance materials	(i) Ensure that the project sites are cleared of solid waste or other nuisance materials (ii) Dispose solid waste from existing sites and materials into designated locations - Appendix 9 provides the Checklist for Solid Waste Management and Transport		PIU	Project cost

Table 14: Environmental Management Plan of Anticipated Impacts during Pre-Construction

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
Compliance with environmental subproject selection criteria	Environmental impacts due to subproject	Compliance with environmental subproject selection criteria A compliance checklist is appended to this report (**Appendix 3**)	Consents, permits, clearance, NOCs, etc.	PIU and Ratangarh Nagar Palika	PMU	No costs required
Legal compliance	Environmental legal noncompliance may attract legal actions Failure to obtain necessary consents, permits, NOCs etc. can result to design revisions and/or stoppage of works	(i) Obtain all consents, clearances (CTE/CTO from RSPCB), permits NOCs etc. before start of construction works (ii) Ensure that all necessary approvals for construction to be obtained by contractor are in	Consents, permits, clearance, NOCs, etc.	PIU/Consultants in coordination of Ratangarh Nagar Palika	PMU	Cost of obtaining all consents, permits, clearance, NOCs etc. prior to start of civil works responsibility of PIU.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		place before start of construction				
Environmental monitoring of baseline conditions of air, noise, water and soil	To establish base line environmental conditions	Environmental monitoring through NABL approved laboratory	Environmental Monitoring Report of Air, noise, soil and water quality	Construction contractor	Consultants/PIU	Contractor
Utilities	Telephone lines, electric poles and wires, water lines and gas pipe line within proposed project area	(i) Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and (ii) Require construction contractors to prepare a contingency plan to include actions to be taken in case of unintentional interruption of services. (iii) Require contractors to prepare spoils management plan (**Appendix C-13**) and traffic management plan (**Appendix C-14**)	-List and maps showing utilities to be shifted (i) List of affected utilities and operators; (ii) Bid document to include requirement for a contingency plan for service interruptions (example provision of water if disruption is more than 24 hours), spoil management plan (**Appendix C-13**), and traffic management plan (**Appendix C-14**)	Contractor in collaboration with PIU and with approval of PMU	Consultant / PIU	No cost required. Mitigation measures are part of TOR of PMU, PIU and Consultants

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
Asbestos materials in existing drainage system	Health impacts due to air borne asbestos if handled unsafely, cut, drilled or broken into pieces	(i) Conduct survey and inventory of existing asbestos materials on site (ii) Conduct risk assessment to determine extent of asbestos materials currently on-site (ii) Coordinate and provide support to the asbestos management service provider on the requirement of sampling, testing and disposing existing asbestos materials (iii) Ensure the selected area for temporary storage is suitable for safe storage of asbestos materials (iv) Incorporate international and national standards considered in designing the temporary storage (v) Ensure that handling and		Contractor/PMU	Consultant / PIU	Project costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		disposal of asbestos materials are carried out by specially trained service provider/s following Government of India requirements, or in their absence, internationally recognized procedures Refer to the requirements of the Asbestos Management Plan and instructions of the Asbestos Expert				
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Disruption to traffic flow and sensitive receptors	(i) Prioritize areas within or nearest possible vacant space in the project location; (ii) If it is deemed necessary to locate elsewhere, consider sites that will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems; (iii) Do not consider residential areas;	-List of pre-approved sites for construction work camps, areas for stockpile, storage and disposal -Waste management plan - Written consent of landowner/s (not lessee/s) for reuse of excess spoils to agricultural land	Contractor to finalize locations in consultation and approval of PIU	Consultant / PIU	No cost required. Mitigation measures are part of TOR of PIU and Consultants and also part of contractual terms

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		(iv) Take extreme care in selecting sites to avoid direct disposal to water body which will inconvenience the community. (v) For excess spoil disposal, ensure (a) site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, written consent from landowners (not lessees) will be obtained; (b) debris disposal site shall be at least 200 m away from surface water bodies; (c) no residential areas shall be located within 50 m downwind side of the site; and (d) site is minimum 250 m away from sensitive locations like settlements, ponds/lakes or other water bodies.				
Sources of Materials	Extraction of materials can disrupt natural land	(i) Prioritize sites already permitted by	(i) List of approved quarry sites and sources of materials;	Contractor to prepare list of approved quarry	PMU	No cost required.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
	contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	the Department of Mines and Geology (ii) If other sites are necessary, inform construction contractor that it is their responsibility to verify the suitability of all material sources and to obtain the approval of PMU and (iii) If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from PIU.	(ii) Bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.	sites and sources of materials with the approval of PIU		Mitigation measures are part of TOR of PIU and Consultants and also part of contractual terms
Consents, permits, clearances, NOCs, etc.	Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	(i) Obtain all necessary consents, permits, clearance, NOCs, etc. prior to award of civil works. (ii) Following consents are required- Tree cutting- local authority Storage, handling and transport of hazardous materials- RSPCB Sand mining, quarries, borrow	Consents, permits, clearance, NOCs, etc. Incorporated in final design and communicated to contractors.	PIU and Consultants	PIU	No cost required. Cost of obtaining all consents, permits, clearance, NOCs, etc. prior to start of civil works responsibility of PIU. Mitigation measures are part of TOR of

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		areas- Department of mines and Geology Traffic diversion/road cutting- local authority, traffic police (ii) Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction (iii) Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. (iv) Include in detailed design drawings and documents all conditions and provisions if necessary				PIU and Consultants

Table 15: Environmental Management Plan of Anticipated Impacts during Construction

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
EMP Implementation Training	Irreversible impact to the environment,	(i) Project manager and all key workers will be required to undergo EMP implementation	(i) Certificate of Completion (Safeguards	Construction Contractor	CMSC/ PIU	Cost of EMP Implementation Orientation Training to

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	workers, and community	including spoils management, Standard operating procedures (SOP) for construction works; occupational health and safety (OH&S), core labor laws, applicable environmental laws, etc. (ii) Contractor has to depute a qualified EHS personnel in the start of the project to conduct training to all the personnel and effective monitoring of mitigation measures during construction	Compliance Orientation) (ii) Posting of Certification of Completion at worksites (iii) Posting of EMP at worksites			contractor is responsibility of PMU. Other costs responsibility of contractor.
Air Quality	Emissions from construction vehicles, equipment, and machinery used for construction resulting to dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulphur oxides, particulate	(i) Consult with PIU on the designated areas for stockpiling of clay, soils, gravel, and other construction materials; (iii) Damp down exposed soil and any stockpiled material on site by water sprinkling necessary during dry weather; (iv) Use tarpaulins to cover sand and other loose material when transported by trucks; and (v) Fit all heavy equipment and machinery with air pollution control devices which are operating correctly. (vi) Quarterly environmental monitoring for ambient air as per EMP	(i) Location of stockpiles; (ii) Complaints from sensitive receptors; (iii) Heavy equipment and machinery with air pollution control devices; (iv) Certification that vehicles are compliant with Air Act (v) Quarterly environmental monitoring report for ambient air, noise, water and soil	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	matter, nitrous oxides, and hydrocarbons.					
Water quality	Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during construction can contaminate nearby surface water quality.	(i) Prepare and implement a spoils management plan (**Appendix C-13)** (ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; (ii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; (iii) Place storage areas for fuels and lubricants away from any drainage leading to water bodies; (iv) Dispose any wastes generated by work in designated sites; and (v) Conduct surface quality Monitoring according to the Environmental Management Plan (EMP)	(i) Areas for stockpiles, storage of fuels and lubricants and waste materials; (ii) Number of silt traps installed along trenches leading to water bodies; (iii) Records of surface water quality Monitoring; (iv)Effectiveness of water management measures; (v) No visible degradation to nearby drainages, Nalas or waterbodies due to civil works	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Noise Levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people	(i) Plan activities in consultation with PIU/Consultants so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; (ii) Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach;	(i) Complaints from sensitive receptors; (ii) Use of silencers in noise-producing equipment and sound barriers; (iii) Equivalent day and night time noise levels (see	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(iii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and (iv) Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s. (v) Quarterly environmental monitoring for ambient noise as per EMP	**Appendix C-6** of this IEE)- No complaints from sensitive receptors;			
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; Dispose any oil contaminated wastes generated by construction activities in scientific manner; and Conduct ground water quality monitoring according to the EMP	(i) Areas for storage of fuels and lubricants and waste materials; (ii) Number of oil traps installed in oil and lubricant storage areas; -Complaints from sensitive receptors; -CTO and CTE compliance; Monitoring Reports;	Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Drain desilting and site clearance at existing pumping station sites	Contamination of land, surface and groundwater; occupational and	(i) Desilting process of shall be conducted in dry season only (ii) Prior to desilting process, the drains shall be allowed dry so that there is no standing water on silt / sediment	(i) desilting schedule and proposed method (ii) PPEs to workers	Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	community heath and safety	(iii) Do not conduct manual desilting process, use appropriate equipment / implements (iv) Desilting process shall be conducted in such a way that water content of the silt/sediment is low, so that contaminated water is not spilled during the loading, transport and unloading process.; (v) Workers shall be provided with appropriate PPE's; masks with oxygen cylinders shall be made available at the site, which shall be utilised during emergency (vi)Adapt site-specific health and safety measures; sites/facilities at the existing pumping stations present harmful conditions for the workers due to accumulated wastewater and solid waste, proper measures shall be implemented (vii) identify beneficial uses or dispose at suitable disposal site in consultation with the PIU/ULB:	(iii) Reuse or disposal site identification			
Landscape and aesthetics	Impacts due to excess excavated earth, excess construction materials, and solid waste such as removed concrete,	(i) Prepare and implement spoils management plan (**Appendix C-13**); (ii) Avoid stockpiling of excess excavated soils; (iii) Coordinate with ULB/PIU for beneficial uses of excess excavated soils or immediately dispose to designated areas;	(i) Complaints from sensitive receptors; (ii) Worksite clear of hazardous wastes such as oil/fuel (iiv) Worksite clear of any excess excavated earth,	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items.	(iv) Recover used oil and lubricants and reuse or remove from the sites; (v) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; (vi) Remove all wreckage, rubbish, or temporary structures which are no longer required; and (vii) Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.	excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers As per Appendix-C-13.			
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure at specified project location	(i) Obtain from PIU the list of affected utilities and operators if any; (ii) Prepare a contingency plan to include actions to be done in case of unintentional interruption of service (iii) Take prior permission from concerned departments for shifting/removing the utilities (iv) inform nearby community in advance about the nature and timings of disturbance	As per contingency plan	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Ecological Resources – Terrestrial	Loss of vegetation and tree cover	(i) Minimize removal of vegetation and disallow cutting of trees; (ii) If tree-removal will be required, obtain tree-cutting permit from the Revenue Department; and (iii) Plant three native trees for every one that is removed.	-Records -Plant native tree species as per RUDSICO-EAP Policy	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Land use	Environmental Issues due to land use change	The impact due to change in land use will be negligible due to this project.	-Latest land use records	Not applicable	PMU	Not applicable
Accessibility	Traffic problems and conflicts near project locations and haul road	(i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites; (ii) Schedule transport and hauling activities during non-peak hours; (iii) Locate entry and exit points in areas where there is low potential for traffic congestion; (iv) Keep the site free from all unnecessary obstructions; (v) Drive vehicles in a considerate manner; (vi) Coordinate with Traffic Police for temporary road diversions and with for provision of traffic aids if transportation activities cannot be avoided during peak hours; (vii) Notify affected sensitive receptors 1-week in advance through consultations and by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints. (viii) Plan and execute the work in such a way that the period of disturbance/ loss of access are minimum.	(i) Traffic route during construction works including number of permanent signages, barricades and flagmen on worksite (ii) Complaints from sensitive receptors; (iii) Number of signages placed at project location. As per Traffic Management Plan given in **Appendix C-14.**	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(ix) Provide pedestrian access in all the locations until normalcy is restored.				
Socio-Economic – Income.	Impede the access of residents and customers to nearby shops	(i) Prepare and implement spoils management plan (**Appendix C-13**). Contractor to Implement RP and to follow mitigation measures prescribed such as- (ii) Leave spaces for access between mounds of soil; (ii) Provide walkways and metal sheets where required for people; (iii) Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools; (iv) Consult businesses and institutions regarding operating hours and factoring this in work schedules; and (v) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.	(i) Complaints from sensitive receptors; (ii) Spoils management plan (iii) Number of walkways, signages, and metal sheets placed at project location.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Socio-Economic - Employment	Generation of temporary employment and increase in local revenue	(i) Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; (ii) Secure construction materials from local market. (iii) Comply with labor laws	(i) Employment records; (ii) Records of sources of materials (iii) Compliance to labor laws (see **Appendix C-12** of this IEE)	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Occupational Health and Safety	Occupational hazards which can arise during work	(A) Comply with all national, state and local core labor laws (see **Appendix C-12** of this IEE) (B) Ensure that qualified EHS personnel is deputed to look the H&S matter, EHS personnel should ensure to comply following- (i) Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment like helmet, gumboot, safety belt, gloves, nose musk and ear plugs; (c) OH&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; (ii) Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site; (iii) Provide medical insurance coverage for workers; (iv) Secure all installations from unauthorized intrusion and accident risks; (v) The project area experiences extreme temperature during summer months of April and May, which may affect the health of	(i) Site-specific OH&S Plan; (ii) Equipped first-aid stations; (iii) Medical insurance coverage for workers; (iv) Number of accidents; (v) Supplies of potable drinking water; (vi) Clean eating areas where workers are not exposed to hazardous or noxious substances; (vii) record of H&S orientation trainings (viii) personal protective equipment; (ix) % of moving equipment outfitted with audible back-up alarms; (xi) permanent sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		workers engaged in construction work. Contractor should take necessary measures during summers including the following: (a) work schedule should be adjusted to avoid peak temperature hours (12 – 3 PM); (b) provide appropriate shade near the work place; allow periodic resting and provide adequate water, and (c) provide necessary medicine and facilities to take care of dehydration related health issues (v) Provide supplies of potable drinking water; (vi) Provide clean eating areas where workers are not exposed to hazardous or noxious substances; (vii) Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; (viii) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; (ix) Ensure the visibility of workers through their use of high visibility vests when working in or walking	high voltage equipment, and areas for storage and disposal. (xii) Compliance to core labor laws (see **Appendix C-12** of this IEE)			

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		through heavy equipment operating areas; (x) Ensure moving equipment is outfitted with audible back-up alarms; (xi) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and (xii) Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively. (xiii) Provide proper solid and liquid waste management program in workers' campsite, separate from spoils and debris disposal, as their presence can add to existing waste volume at the project sites. (xiv) Adapt site-specific health and safety measures; sites/facilities at the existing pumping stations present harmful conditions for the				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		workers due to accumulated wastewater and solid waste, proper measures shall be implemented				
Community Health and Safety.	Traffic accidents and vehicle collision with pedestrians during material and waste transportation	(i) Plan routes to avoid times of peak-pedestrian activities. (ii) Liaise with PIU/ULB in identifying high-risk areas on route cards/maps. (iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure. (iv) Provide road signs and flag persons to warn of on-going trenching activities.	(i) Traffic Management Plan (**Appendix C-14**); (ii) Complaints from sensitive receptors	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Safety requirements for deep trench works	Accidents, and risk hazard	Complete information on the underground structures (such as water pipelines, sewers, gas mains, electrical conduit system and other civic facilities) should be collected before doing the excavation work. Proper precautions shall be taken to prevent accident to the workmen engaged in excavation work and for the general public All trenches in soil more than 1.5 m deep shall be securely shored and timbered. All trenches in friable or unstable rock exceeding 1.5 m in depth shall be securely shored and timbered	Contractor's method statement for excavations On-site verification	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		Where the sides of trenches are sloped but not within 1.5 m of the bottom, the vertical sides shall be shored and the shoring shall extend at least 30 cm above the vertical sides. When open spaced sheathing is used, a toe board shall be provided to prevent material rolling down the slope and falling into the part of the trench with vertical walls. Shoring and timbering shall be carried along with the opening of a trench but when conditions permit, protection work, such as sheet piling may be done before the excavation commences. Approved quality of material with adequate structural strength shall be used for shoring and timbering a trench. Workers shall be instructed to use safety devices and appliances provided to them whenever it is necessary to do so Workers who are not aware of the hazards specific to the work shall not be permitted to proceed with the work without being properly instructed. Safety helmets shall be worn by all persons entering trench where hazards from falling stones, timber or other materials exist Appropriate safety footwear (rubber boots, protective covers, etc.,) shall be worn by labours				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		who are engaged in work requiring such protection Sides of excavation shall be inspected by PIU/PMDSC during the course of excavation from time to time and after every rain, storm or other hazard-increasing occurrence and protection against slides and caving shall be increased, if necessary				
Safety of sensitive groups (children, elders etc.) and others pedestrians in narrow streets	Trench excavation in in narrow streets will pose high risk to children and elders in the locality	(i) Provide prior information to the local people about the nature and duration of work (ii) Conduct awareness program on safety during the construction work (iii) Undertake the construction work stretch-wise; (iv) Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches	-H&S plan including appropriate signs for each hazard present -Construction vehicles condition in H&S plan. Complaints from neighbourhood and monitoring of accidents	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Work Camps and work sites	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants	(i) Consult with PIU before locating project offices, sheds, and construction plants; (ii) Minimize removal of vegetation and disallow cutting of trees; (iii) Provide drinking water, water for other uses, and sanitation facilities for employees; (iv) Ensure conditions of livability at work camps are maintained at the highest standards possible at all times;	(i) Complaints from sensitive receptors; (ii) Drinking water and sanitation facilities for employees – (iii)Condition in list of preapproved sites for construction work camps, areas for stockpile, storage	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	Unsanitary and poor living conditions for workers	(v) Train employees in the storage and handling of materials which can potentially cause soil contamination; (vi) Recover used oil and lubricants and reuse or remove from the site; (vii) Manage solid waste according to the preference hierarchy: reuse, recycling and disposal to designated areas; (viii) Ensure unauthorized persons especially children are not allowed in any worksite at any given time.	and disposal prepared by the Contractor.			
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	(i) Contractors should have hand held noise level meter for measurement of noise during night hours (ii) Contractors should have hand held lux meter for the measurement of illumination during night hours (iii) Preferably electrical connections is available for running equipments otherwise sound proof/super silent Diesel Generator set should be available (iv) Sound level should not increase as per EMP (v) Illumination should be adequate as required according to nature of works	As per Management Plan for night works (**Appendix C-18**).	Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(vi) 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 (vii) All the noise activity like hammering, cutting, crushing, running of heavy equipment should be done in day time and avoided in night time (viii) Workers engaged in night works should have adequate rest/sleep in day time before start of night works (ix) 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 (x) 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 (xi) Workers should be trained before start of night works about risks and hazards of night works				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		and their mitigation measures and should be provided all the protective aids (PPEs) including fluorescent/retro-reflective vests (xii) Horns should not be permitted by equipments and vehicles (xiii) Workers should not shout and create noise (xiv) First aid and emergency vehicles should be available at site (xv) Emergency preparedness plan should be operative during night works (xvi) Old persons and pregnant women and women having small kids should not work in night time (xvii) All the vehicles and equipment being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise (xviii) All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works				
Social and Cultural Resources	Risk of archaeological chance finds	(i) Consult with concerned religious authorities, nearby people and devotees in pre-	Chance find protocol (**Appendix C-26**)	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		construction phase and explain the work method and duration of proposed works, take their suggestions and comments and incorporate in design the mitigation measures required (ii) Adjacent to religious/social sites, undertake excavation and construction work in such a way that no structural damage is caused to the religious building. (iii) 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, (iv) provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.				responsibility of contractor.
Monsoon preparedness	Disruption of utilities and water logging in trenches	(i) As for a possible avoid trench works and excavation works during monsoon season to avoid any water logging and accident due to it (ii) if open trenches are not avoidable during monsoon, keep ready all the mitigations measures to avoid water logging such as	As per monsoon preparedness plan& as per **Appendix C-19** "Guidelines for Safety during Monsoon/Heavy Rainfall"	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		dewatering pumps and sufficient pipes, traffic assistance, barricades etc. (iii) Guidelines for safety during monsoon is attached as **Appendix C-19**				
Submission of EMP implementation report	Unsatisfactory compliance to EMP	(i) Appointment of supervisor to ensure EMP implementation (ii) Timely submission of monitoring reports including pictures	Availability and competency of appointed supervisor Monthly report	Construction contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
COVID-19 prevention and control during construction works	Health risk to workers due to COVID-19 virus	(i) provide face mask, hand gloves and sanitizers to workers during works (ii) Keep social distancing (iii) Educate workers about risks of COVID-19 (iv) Health check-up of workers suffering with symptoms of COVID-19 and test for same (v) isolation of workers suspected/suffering with COVID-19 and due medical care (vi) follow guidelines of WHO/Central/State/Local government and RUDSICO-EAP regarding COVID-19 (refer **Appendix C-23 & 24**)	Compliance of COVID-19 protocol and guidelines	Construction contractor	CMSC/ PIU	Contractor
Post-construction clean-up	Damage due to debris, spoils, excess construction materials	(i) Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and (ii) All excavated roads shall be reinstated to original condition. (iii) All disrupted utilities restored	PIU/Consultant report in writing that (i)worksite is restored to original conditions; (ii)camp has been vacated and	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(iv) All affected structures rehabilitated/compensated (v) The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up. (vi) All hardened surfaces within the construction camp area shall be ripped, all imported materials removed, and the area shall be top soiled and regrassed using the guidelines set out in the revegetation specification that forms part of this document. (vii) The contractor must arrange the cancellation of all temporary services. (viii) Request PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.	restored to pre-project conditions; (iii)All construction related structures not relevant to O&M are removed; and (iv) worksite clean-up is satisfactory.			

Table 16: Environmental Management Plan of Anticipated Impacts during Operation

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Cleaning of drainage	All work sites- Cleaning of drains may cause traffic disturbances, nuisances, public & worker safety	Remove the silts and other solid waste after cleaning the drains from site and dispose at approved dumping site in scientific manner Ensure traffic management during cleaning of drains and	Site inspection will be done as per checklist is given in **Appendix C-16**.	Weekly during construction	Supervising staff and safeguards specialists	No costs required

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		transportation of silt and solid waste				
Check the blockages, overflow problem in drains	It may affect the draining system, overflow problem may contaminate land, water and create public health issues	Regular cleaning of drains, specially before start of monsoon to avoid blockages Implementation of regular O&M schedules	Follows regular O & M schedule	Ratangarh Nagar Palika	Ratangarh Nagar Palika	Ratangarh Nagar Palika
Disposal of silt and solid waste	Unsafe disposal of silt and solid waste may cause public nuisance and health issues	Identify the suitable place for disposal of silt and solid waste, away from habitation, in a scientific manner so that it may not cause public nuisance	Disposal site at suitable location	Ratangarh Nagar Palika	Ratangarh Nagar Palika	Ratangarh Nagar Palika
Safety precautions during drainage cleaning	Health and safety risk to workers engaged in drainage cleaning	Ensure all the safety equipment are available during manual cleaning As for as possible, use mechanical cleaning for cleaning of drains	-Training and Awareness campaign for Occupational, Health & Safety to ensure the use of PPE's.	Ratangarh Nagar Palika	Ratangarh Nagar Palika	Ratangarh Nagar Palika

Table 17: Environmental Monitoring Plan of ambient air, noise, water and soil quality and other during Construction

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Construction disturbances, nuisances, public & worker safety	All work sites	Implementation of dust control, noise control, traffic management, & safety measures, chance find protocol. Site inspection checklist to review implementation is appended at **Appendix C-16**	Weekly during construction	Supervising staff, EHS officer and safeguards specialists	No costs required
Tree cutting	Alignment of both drains	Tree cutting permit taken, Tree cutting done	Continuous	Supervising staff, EHS officer and safeguards specialists	Contractor
Ambient air quality	At 7 different locations to be decided by the Environment Specialist of PMCBC.	PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO	Once before start of construction and yearly 3 times excluding monsoon season during construction periods (24 months period considered).	Contractor	Cost for implementation of monitoring measures responsibility of contractor (49 samples)
Ambient noise	At 7 different locations to be decided by the Environment Specialist of PMCBC	Day time and night time noise levels	Once before start of construction and yearly 3 times excluding monsoon season during construction periods (24 months period considered).	Contractor	Cost for implementation of monitoring measures responsibility of contractor (49 samples)
Ground / Surace Water quality	At 7 different locations to be decided by the Environment Specialist of PMCBC	pH, TDS, Total Hardness, Zn, Chloride, Iron, Copper, DO, Manganese, Suplhate, Nitrate, Fluiride, Hg, Cadmium, Cr+6, Arsenic, Lead, Total Alkalinity,	Once before start of construction and yearly 3 times excluding monsoon season during construction periods (24	Contractor	Cost for implementation of monitoring measures responsibility of contractor (49 samples)

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
		Phosphate, Phenolic compound	months period considered).		

Table 17: Environmental Monitoring Plan of Anticipated Impacts during Operation

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Monitoring of drain conditions	Full length of both the drains	Cracks, blockage, leakages etc.	Monthly	Ratangarh Nagar Palika	Ratangarh Nagar Palika
Monitoring of plantations	Plantations locations	Nos. of tree survived	monthly	Ratangarh Nagar Palika	Ratangarh Nagar Palika
Disposal of silt and solid waste after cleaning of drains	Full length of both the drains	Identify suitable site and disposal of silt and solid waste in scientific manner	Monthly/ when required	Ratangarh Nagar Palika	Ratangarh Nagar Palika

B. Institutional Arrangements

194. The Local Self Government Department (LGSD) is the executing agency which is responsible for the overall strategic guidance and ensures the compliance with ADB loan covenants. RUDSICO is the implementing agency responsible for the technical supervision and project implementation. The RUDSICO Board (under the chairmanship of the Honorable Minister), the LGSD and the City Level Monitoring Committees (CLMCs, under the chairmanship of their respective commissioner/executive officer) is proposed to monitor the project implementation. The PMU is already established at state-level (Jaipur) and headed by a dedicated Project Director. The PIUs have two zonal offices (1 in Jaipur and 1 in Jodhpur). Each zonal office is headed by an additional chief engineer. Urban Local Bodies (ULBs) will be the final custodian and user of the created infrastructure. As primary stakeholders, the ULBs will be involved and engaged in the day-to-day monitoring and implementation.

195. At the PMU level, the Project Director is being supported by Additional Project Director (Chief Engineer-level) and a Chief Engineer, who are being supported by Dy Project Directors (Technical and Administration) and a financial advisor. There is one project officer for Social and another project officer for Environmental aspects within PMU.

196. The PMU is being supported by the Project Management and Capacity Building Consultants (PMCBC). The PMCBC shall manage preparation/vetting design documents, tendering of contracts, implementation of resettlement, environmental management and gender action plans; setting and managing project performance monitoring systems, planning and managing implementation of training and capacity building as well as institutional strengthening activities besides preparing reports as per ADB requirements. PMCBC has engaged a social safeguard specialist and environmental safeguard specialist at the PMU level for managing all social and environmental safeguard related support services as envisaged in its scope of work. They will be assisted by concerned field level safeguard support staffs of CMSCs and PIU.

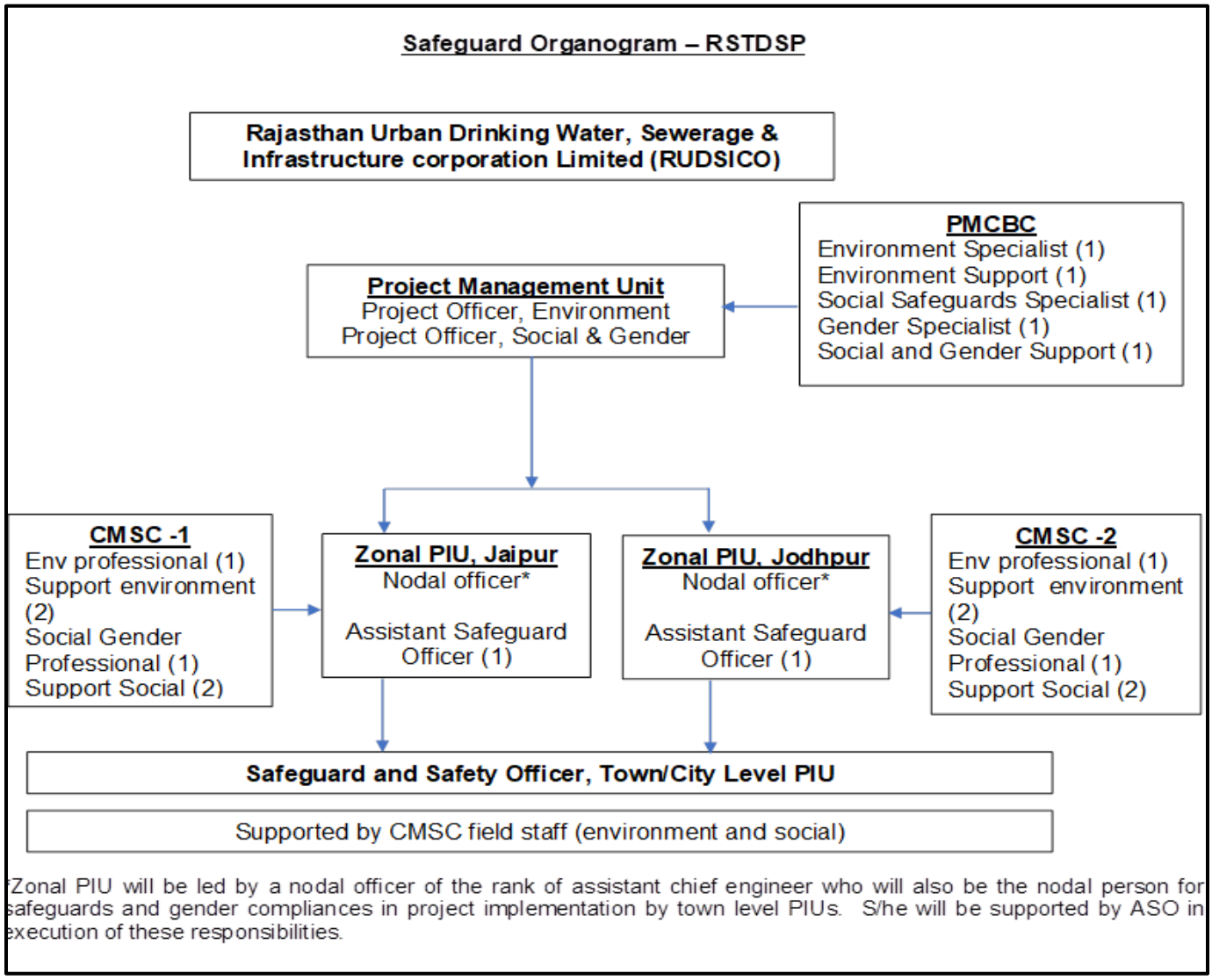
197. There are two zonal PIUs already established in Jaipur and Jodhpur. One PIU shall be established at every town before award of new projects. PIUs at the town-level shall be headed by a Superintending Engineer / Executive Engineer, who shall work as Project Manager and shall sign the contract documents, manage the contract and disburse payments as Drawing and Disbursing Officer.

198. **Construction management and supervision consultants (CMSCs) -** 2 nos. of CMSCs catering to Jaipur and Jodhpur units are already established. They shall directly support PIUs in day to day contract management, construction supervision including quality management of ongoing works etc. This shall include work measurement, quantities, verification of bills of contractors etc. In compliance with the EMP, the CMSCs shall develop a strategy to overcome the difficulties of construction/traffic management in narrow streets and also prepare detailed plans for detour of traffic during excavation. The CMSC will propose and implement mechanism for coordination among all stakeholders such as traffic police, roads department, user committees, etc., for smooth construction execution. Adequate measures shall be taken for working near physical cultural resources involving close coordination with the Department of Archaeology. The CMSC will lead design of surveys and investigations required for the protection of archaeological sites/heritage areas and prepare Archaeological Impact Assessments, or other agreed upon document to be approved by the Department of Archaeology for the archaeologically sensitive locations.

199. **Community awareness and public participation consultants (CAPPC)-** CAPC core unit is already established at PMU, Jaipur and at fields in ongoing 14 project towns. CAPC field team will be established in upcoming project towns after PIUs are formed in new towns. CAPC will closely work in the field (with PIUs) to facilitate creation of project awareness and ensuring public participation for all project works at the community level. This shall mainly involve house connections for water supply, sewerage and metering. CAPPC shall also undertake various IEC activities to promote and pursue health and hygiene among the communities.

200. **Figure 32** shows Environmental Safeguards Implementation Arrangements within RUDSICO-EAP and **Table 18** summarize the institutional responsibility of environmental safeguards implementation at all stages of the project.

Figure 32 : Environmental Safeguards Implementation Arrangement



201. **Project Management Unit.** RUDSICO will establish a state-level PMU, headed by dedicated project director, and housed in EAP division of RUDSICO. For the purpose of project implementation, 2 Zonal project implementation units (Zonal PIUs), at Jaipur and Jodhpur, headed by additional chief engineers (ACE) will be established. At PMU, there will be two dedicated project officers (i) project officer (Environment) and (ii) project officer (Social and Gender), who will be responsible for compliance with the environmental, social safeguards and gender in program implementation. Key responsibilities of the project officer (Environment) are enumerated in **Table 18**.

202. The PMU will be supported by 3 institutional consultants under the supervision and control of PD, PMU: (i) the project management and capacity building consultants (PMCBC) will support the PMU; (ii) 2 CMSC will support the 2 zonal PIUs and town-level PIUs; and (iii) CAPPC, will support the zonal PIUs and town-level PIUs.

203. **Zonal Project implementation units (Zonal PIUs).** There are 2 zonal level PIUs at Jaipur and Jodhpur. Under each zonal PIU, there will be city/town level PIUs, for ease of day-to-day monitoring and management at local level. The additional chief engineer at each Zonal PIU will serve as the Nodal Officer, Safeguards and Gender. Each Zonal PIU will be staffed with an assistant safeguards officer (ASO Environmental and Social Safeguards) who will assist PMU project officer (environment/social) in implementation of the environmental/social safeguards and GESI action plan in PIUs under its jurisdiction. Zonal PIUs will undertake internal monitoring and supervision and record observations throughout the project period to ensure that the safeguards and mitigation measures are provided as intended.

The zonal level ASO will oversee safeguards implementation by the city/town level PIUs, coordinate public consultations, information disclosure, regulatory clearances and approvals, implementation of resettlement plans, EMP implementation, and grievance redressal.

204. **Town/City Level Project Implementation Unit.** The town-level PIUs shall be responsible for the quality of works executed under the project and will be guided by the zonal PIUs. The city/town PIUs will be responsible for implementation of the IEE. The town-level PIUs will be headed by a project manager (executive engineer or assistant engineer) and supported by CMSC field staff. Environment Safeguard Professional of CMSCs will assist PIUs in implementation of environmental safeguard. At each PIU, the Assistant Project Manager will be given additional responsibilities of safeguard tasks and will be designated as safeguard and safety officer (SSO). The SSO will be assisted by the social and gender specialist and environment specialist of CMSC in reviewing updated/revised IEEs, etc. They will also be responsible for coordination of field level activities related to safeguards conducted by the contractor and CMSC. Key responsibilities of the town-level environment specialist are enumerated in **Table 18**.

205. **Contractors.** The contractor will be required to update the IEE and will be responsible for providing final design verification to the supervision consultant for finalization/updating of resettlement plan. The contractor shall appoint an environment, health and safety (EHS) engineer who will be responsible on a day-to-day basis for (i) ensuring implementation of EMP, (ii) coordinating with the town-level PIUs and environment specialists of project consultant teams; (iii) community liaison[28] consultations with interested/affected people, (iv) field-level grievance redress; and (iv) reporting.

206. The Contractor has required to submitted to RUDSICO-EAP, for review and approval, a SEMP including (i) proposed sites or 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 per SEMP; (iv) budget for SEMP implementation. No works can commence prior to approval of SEMP.

207. A copy of the EMP or approved SEMP will be kept on-site during the construction period at all times. Non-compliance with, or any deviation from, the conditions set out in the EMP or SEMP constitutes a failure in compliance and will require corrective actions. The EARF and the IEEs specify responsibilities in EMP implementation during design, construction and O&M phases.

[28] Reasonable size social outreach team (SOT) to be appointed by contractor to facilitate community liaison, consultations and R&R implementation (including resolution of grievances). Requirement of SOT will be included in bid document.

208. RUDSICO-EAP will ensure that bidding and contract documents include specific provision requiring Contractors to comply with: (i) all 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.

Table 18: Institutional Roles and Responsibilities for Environmental Safeguards Implementation

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
PMU (Project Officer; Environment),	(i) Review REA checklists and assign categorization based on ADB SPS 2009 (ii) Review and approve EIA/IEE (iii) Submit EIA/IEE to ADB for approval and disclosure in ADB website (iv) Ensure approved IEEs are disclosed in RSTDSP/PMU websites and summary posted in public areas accessible and understandable by local people. (v) Ensure environmental management plans (EMPs) are included in the bid documents and contracts (vi) Organize an orientation workshop for PMU, PIU, ULB and all staff involved in the project implementation on (a) ADB SPS, (b) Government of India national, state, and local environmental laws and regulations, (c) core labor standards, (d) OH&S, (e) EMP implementation especially spoil management, working in congested areas, public relations and ongoing consultations, grievance redress, etc. (vii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (viii) Organize an induction course for the training of contractors preparing them on EMP implementation,	(i) Over-all environmental safeguards compliance of the project (iii) Monitor and ensure compliance of EMPs as well as any other environmental provisions and conditions. (i) Review monthly monitoring report (ii) Prepare and submit to ADB semi-annual monitoring reports (iv) If necessary, prepare Corrective Action Plan and ensure implementation of corrective actions to ensure no environmental impacts; (iii) Review and submit Corrective Action Plans to ADB (iv) Organize capacity building programs on environmental safeguards (iv) Coordinate with national and state level government agencies (vi) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (ix) Coordinate PIUs, consultants and contractors on mitigation measures involving the community and affected persons and ensure that environmental concerns and suggestions are incorporated and implemented	Compliance monitoring to review the environmental performance of project component, if required and as specified in EMP

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	environmental monitoring requirements related to mitigation measures; and taking immediate actions to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation. (ix) Ensure compliance with all government rules and regulations regarding site and environmental clearances as well as any other environmental requirements (x) Assist PMU, PIUs, and project NGOs to document and develop good practice construction guidelines to assist the contractors in implementing the provisions of IEE. (xi) Assist in the review of the contractors' implementation plans to ensure compliance with the IEE.		
PIU, Safeguard and Safety Officer (SSO)	(i) Ensure IEE is included in bid documents and contract agreements. Ensure cost of EMP implementation is provided. (iv) Disclose of approved EIAs/IEEs. (v) Obtain all necessary clearances, permits, consents, NOCs, etc. Ensure compliance to the provisions and conditions. (vi) EMP implementation regarding sites for disposal of wastes, camps, storage areas, quarry sites, etc. (vii) Organize an induction course for the training of contractors, preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures, and on taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found	(i) oversee day-to-day implementation of EMPs by contractors, including compliance with all government rules and regulations. (ii) take necessary action for obtaining rights of way; (iii) oversee implementation of EMPs, including environmental monitoring by contractors; (iv) take corrective actions when necessary to ensure no environmental impacts; (v) submit monthly environmental monitoring reports to PMU, (vi) conduct continuous public consultation and awareness; (vii) address any grievances brought about through the grievance redress mechanism in a timely manner as per the IEEs; and	(i) Conducting environmental monitoring, as specified in the EMP. (ii) Issuance of clearance for contractor's post-construction activities as specified in the EMP.

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	during the course of implementation.		
Consultant – 1.PMCBC-Environmental Safeguard Specialist – 1 no.	(i) Review IEE/EMP submitted by CMSC and revise report to submit to PMU (ii) Assist PMU and PIU in obtaining all necessary clearances, permits, consents, NOCs, etc. Ensure provisions and conditions are incorporated in the IEE and detailed design documents. (iii) Assist in ensuring IEE is included in bid documents and contract agreements. (iv) Assist in determining adequacy of cost for EMP implementation. (v) Assist in addressing any concern related to IEE and EMP. (vi). Conduct specific assessment requirements	(i) Monitor EMP implementation (ii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs.	
Consultant- 2. CMSC- 2 nos. Environmental safeguards professional	(i) Update initial environmental assessment for proposed project using REA checklists and submit to PIU/PMCBC (ii) Assist in summarizing IEE and translating to language understood by local people.	Monitoring of Implementation of EMP at site by contractor Recommend corrective action measures for non-compliance by contractors Assist in the review of monitoring reports submitted by contractors (iv) Assist in the preparation of monthly monitoring reports conduct continuous public consultation and awareness;	(i) Assist in the inspection and verification of contractor's post-construction activities.
Contractors (EHS Engineer)	(i) Review the IEE and provide information about changes needed as per revised design and scope of works to ESS of PMCBC for final revision of IEE (ii)Prepare EHS plan and take approval from CMSC/PIU and Ensure EMP implementation cost is included in the methodology. (iii) Undergo EMP implementation orientation by ESS of supervision consultant prior to start of works	(i) Implement EMP. (ii) Implement corrective actions if necessary. (iii) Prepare and submit monitoring reports including pictures to PIU (iv) Comply with all applicable legislation, is conversant with the requirements of the EMP; (v) Brief his staff, employees, and laborer about the requirements of the EMP and provide environmental awareness training to staff, employees, and laborers;	(i) Ensure EMP post-construction requirements are satisfactorily complied (ii) Request certification from PIU

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	(iv) Provide EMP implementation orientation to all workers prior to deployment to worksites (v) Seek approval for camp sites and sources of materials. (vi) Ensure copy of IEE is available at worksites. Summary of IEE is translated to language understood by workers and posted at visible places at all times.	(vi) Ensure any sub-contractors/ suppliers who are utilized within the context of the contract comply with all requirements of the EMP. The Contractor will be held responsible for non-compliance on their behalf; (vii) Bear the costs of any damages/compensation resulting from non-adherence to the EMP or written site instructions; (viii) Ensure that PIU and ACM/SO are timely informed of any foreseeable activities related to EMP implementation.	

C. Capacity Building and Development

209. Executing and implementing agencies need to have a sustained capacity to manage and monitor environmental safeguards. Although specialist consultants support will be available to PMU and PIUs, it is necessary to mainstream safeguards in day-to-day working. Therefore, PMU and PIUs require capacity building measures for (i) a better understanding of the project-related environmental issues; and (ii) to strengthen their role in preparation of IEE, implementation of mitigation measures, and subsequent monitoring. Trainings and awareness workshops are included in the project with the primary focus of enabling the PMU and PIU staff to understand impact assessments and carry out environmental monitoring and implement EMPs. After participating in such activities, the participants will be able to review environmental assessments, conduct monitoring of EMPs, understand government and ADB requirements for environmental assessment, management, and monitoring (short- and long-term), and incorporate environmental features into future project designs, specifications, and tender documents and carry out necessary checks and balances during project implementation.

210. PMCBC's ESS shall assess the capabilities of the target participants, customize the training modules accordingly and provide the detailed cost.

211. Typical modules would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The proposed training project, along with the frequency of sessions, is presented in **Table 19**.

Table 19: Capacity Building Program on EMP Implementation

Sl. No.	Description	Target Participants and Venue	Cost and Source of Funds
1	Introduction and Sensitization to Environmental Issues (1 day) - ADB Safeguards Policy Statement -EARF of RSTDSP -Government of India and Rajasthan applicable safeguard laws, regulations and policies including but not limited to core labor standards, OH&S, etc. -Incorporation of EMP into the project design and contracts -Monitoring, reporting and corrective action planning	All staff, ULBs and consultants involved in the project At PMU, Jaipur	PMU cost
2	Treated Effluent Reuse Concepts, Design and Management	All staff at PMU and ULBs	PMU cost
3	Sludge Reuse Concept, Design and Management	All staff at PMU and ULBs	PMU cost
4	EMP implementation (2 days) -Roles and responsibilities -OH&S planning and implementation -Wastes management (water, hazardous, solid, excess construction materials, spoils, etc.) -Working in congested areas, - Public relations - Consultations - Grievance redress -Monitoring and corrective action planning -Reporting and disclosure -Post-construction planning	All staff and consultants involved in the subproject All contractors before start of construction works At PIU	PMU cost
5	Plans and Protocols (1 day) -Construction site standard operating procedures (SOP) - Asbestos Management Plan -Heritage Impact Assessment -Biodiversity and Critical Habitat Assessment - Site-specific EMP -Traffic management plan -Spoils management plan -Waste management plan - Chance find protocol - O&M plans - Post-construction plan	All staff and consultants involved in the project All contractors before start of construction works or during mobilization stage. At PIU	PMU cost Contractors cost as compliance to contract provisions on EMP implementation
6	Experiences and best practices sharing - Experiences on EMP implementation - Issues and challenges - Best practices followed	All staff and consultants involved in the project All contractors All NGOs At PMU Jaipur	PMU Cost
7	Contractors Orientation to Workers on EMP implementation (OH&S, core labor laws, spoils management, etc.)	All workers (including manual laborers) of the contractor prior to dispatch to worksite	Contractors cost as compliance to contract provisions on EMP implementation

D. Monitoring and Reporting

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

213. During construction, results from internal monitoring by the contractor will be reflected in their monthly EMP implementation reports to the PIU and ACM, CMSC. Project officer (Environment) and ACM will review and advise contractors for corrective actions if necessary. Monthly report summarizing compliance and corrective measures taken will be prepared by safeguard officer with the assistance of ACM and submitted to PMU.

214. Quarterly report shall be prepared by CMSC and PIU and submitted to PMU for review and further actions.

215. Based on monthly and quarterly reports and measurements, PMCBC will draft semi-annual report and submit PMU for their review and further submission to ADB (**Appendix C-15**). Once concurrence from the ADB is received the report will be disclosed in the Project website.

216. The PMU will submit semi-annual environmental and social safeguards monitoring reports to ADB, which will be reviewed and disclosed on ADB's website. The monitoring reports will be prepared by PMU with assistance from the PMCBC based on inputs from the PIU's safeguard officers, CMSC, contractors and NGOs, where relevant. The status of safeguard implementation, issues, and corrective actions including associated cost and schedule are to be clearly reported to ADB. The status of safeguards implementation will also be discussed at each ADB review mission and with necessary issues and agreed actions recorded in Aide Memoires. ADB will also carry out annual environmental and/or social (including gender) reviews of the Project. The outline of the semi-annual environmental monitoring report is in **Appendix C15**. ADB's monitoring and supervision activities are carried out on an ongoing basis until a project completion report (PCR) is issued. Thus, semi-annual report, which may cover O&M of completed packages, will be submitted to ADB until PCR is issued.

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

E. EMP Implementation Cost

218. Most of the mitigation measures require the contractors to adopt good site practice. contractor being bound to adopt several mitigation measures through various legal obligations (e.g. BOCW Act, Labour acts etc.) such as use of PPEs, provide toilets and potable drinking water, labour camp management, safety at work sites, safety in equipment operations etc. which should be part of their normal procedures; are not included in EMP cost of this project. Mitigation that is the responsibility of PIU/ULB will be provided as part of their management of the project, so this also does not need to be duplicated here. Cost for the capacity building program is included as part of the project. Regardless of these, project specific costs of mitigation by the construction contractors are included in the EMP budget for the civil works are enumerated here (**Table 20**).

Table 20: Cost Estimates to Implement the EMP

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
A.	**Mitigation Measures**						
1	Compensatory plantation measures*	Construction	per tree	30	4050	121,500	Civil works cost
	Subtotal (A)					**121,500**	
B.	**Monitoring Measures**						
1	Air quality monitoring**	Pre-construction and Construction (quarterly)	per sample	49	4920	241,080	Civil works cost
2	Noise levels monitoring**	Pre-construction and Construction (quarterly)	Per sample	49	1980	97,020	Civil works cost
3.	Groundwater / Surface water quality**	Pre-construction and Construction (quarterly)	per sample	49	6720	329,280	Civil works cost
	Subtotal (B)					**667,380**	
C.	**Capacity Building**						
1.	Introduction and sensitization to environment issues	Pre-construction	lump sum			100,000	PMU
2.	EMP implementation	Construction	lump sum			50,000	PMU
3.		Construction	lump sum			25,000	PMU

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
	Plans and Protocols		lump sum			25,000	Civil works cost
4.	Experiences and best practices sharing	Construction/ Post-Construction	lump sum			100,000	PMU
5.	Contractors Orientation to Workers on EMP implementation	Prior to dispatch to worksite	Lump sum			25,000	Civil works cost
	Subtotal (C)					**325,000**	
D	**Civil Works**						
1	Water Sprinkling for dust suppression	Construction	KL	3000	111	333,000	Civil works cost
2	**Barricading**						
	Providing and fixing Barricading using 40 mm dia M.S. pipe vertical and horizontal posts	Construction	m	1880	156.5	294220	Civil works cost
	Sub Total (D)					**627,229**	
E	**Grievance Redressal Mechanism**				Lump sum	350,000	Civil works cost
	Sub Total (F)					**350,000**	
	Total (A+B+C+D+E+F)				**INR**	**2,091,100**	

* During the preliminary survey, certain sites were not accessible, and as part of the EMP costing, a total of 10 trees on the higher side were taken into consideration. During service improvement Plan contractor will be required to confirm actual number of tree cutting. As per RUDSICO-EAP policy; compensatory plantation in the ratio of 1:3 is to be followed during construction works.

Summary of EMP Cost incurred by Institution :

Contractor Cost - INR 1,816,109/-
PMU Cost - INR 2,75,000/-
Total - INR 2,091,109/-

(In Words: Rupees Twenty lakhs, ninety one thousand one hundred and nine only)

X. CONCLUSION AND RECOMMENDATION

219. The process described in this document has assessed the environmental impacts of all elements of the Ratangarh drainage subproject. All potential impacts were identified in relation to pre-construction, construction, and operation phases. Planning principles and design considerations have been reviewed and incorporated into the site planning and design process wherever possible; thus, environmental impacts as being due to the project design or location were not significant. During the construction phase, impacts mainly arise from the construction dust and noise, the need to dispose of large quantities of waste soil due to excavation of proposed laying and disposal points; and from the disturbance of residents, businesses, traffic and important buildings by the construction work.

220. Ratangarh town does not have organized drainage system. The existing storm water drainage system comprises secondary drains (streams and artificial drains) and tertiary drains (mostly roadside drains). The absence of appropriate disposal of storm water has led to gross contamination and creates unhygienic conditions in surrounding areas of ponding.

221. Presently there exists a network of storm water drains. The existing network of roadside storm water drains in Ratangarh has been identified under three broad categories as follows: (i) open pucca drains, (ii) closed pucca drains, and (iii) kutcha drains. Ratangarh town has an undulating profile with sand dunes here and there. The land profile of the town is such that depressions are found at many places and hence storm water from existing drains accumulates in various depressions/natural storage ponds (known as Ginani).within the town. As such, there is no definite slope in the town providing smooth drainage outside the municipal area.

222. .Six major areas where ponding occurs are –(i) near Railway Quarter, (ii) at Saraf Sump Well, (iii) at Parmana Taal, (iv) at Main Ginani, (v) near BSNLOffice and (vi) near Hanuman Park. For the proper storage, pumping and disposal of storm water storage Ratangarh drainage subproject is proposed.

223. The new pipelines, new pumping stations and construction of raw water reservoirs at identified disposal sites are proposed which will contribute to an improvement in the physical appearance and condition of the town by helping to remove the large and unsightly pools of water that are an almost permanent feature of the town.

224. Screening of project areas is carried out based on Integrated Biodiversity Assessment Tool (IBAT) and IBAT proximity area report shows that there is no protected or key biodiversity area within 10 km of Ratangarh. Approx. 0.15 ha forest area is required for this subproject component. Therefore, forest land diversion is required and it will be taken from MOEF&CC Regional office Jaipur. No tree cutting will be required as per preliminary design, however , if any tree felling is required measures like compensatory plantation in the ration of 1: 3 and transplantation of trees with girth less than 50 cm will be implemented. There are no ASI or state protected monuments within the project influence zone.

225. No asbestos containing material (ACM) is proposed to be used in the subproject construction. There are however about 5.410 km AC pipes in the existing rising main networks of drainage system which will not be disturbed / replaced or come in contact with the workers and general public and may have serious health implications. Once the new system is operating, the facilities will operate with routine maintenance, which should not affect the environment. Improved system operation will comply with the operation and maintenance manual and standard operating procedures to be developed for all the activities.

226. Anticipated impacts of proposed drainage systems during operation and maintenance will be related to check and repair of blocks, overflows and leakages in drains and Ginanies. Regular cleaning of drains, specially before start of monsoon season is required to avoid any blockage and overflow of drains, which may ultimately create public nuisance such as ponding in nearby places. Identify the suitable place for disposal of silt and solid waste, away from habitation and dispose the silt and solid waste after cleaning of drains; in a scientific manner so that it may not cause public nuisance or any harm to stray animals.

227. 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 implementation. The project's grievance redress mechanism will provide the citizens with a platform for redressing grievances, and describes the channels, timeframe, and mechanisms for resolving complaints about environmental performance.

228. The Environmental Management Plan proposed in the project includes mitigation measures for identified impacts, training and capacity building activities, a monitoring plan to ensure that the environmental standards are maintained throughout the project construction period and a reporting plan to ensure that the project is implemented as per environmentally sound engineering and construction practices. The budgetary provision for mitigating the anticipated impacts by proposed subproject component is made in the project for effective implementation of the EMP Plan. Total estimated cost for EMP implementation is approximately Rs. 2,091,109/- /-.

229. The EMP will assist the PMU, PIU, Consultants and contractors in mitigating the environmental impacts, and guide them in the environmentally sound execution of the proposed project. The EMP will also ensure efficient lines of communication between PIU/ULB, PMU, consultants and contractor. A copy of the EMP shall be kept on-site during the construction period at all times. The EMP shall be made binding on all contractors operating on the site, and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document shall constitute a failure in compliance.

230. The project will benefit the general public by contributing to the long-term improvement of Drainage system and community livability in Ratangarh. The citizens of the Ratangarh town will be the major beneficiaries of the improved drainage system, as the unsightly and unhygienic pools of standing wastewater will gradually disappear and should not recur in future. This should then improve the appearance and environment of the town. If, as expected, this ultimately brings more tourists into the town, then the citizens could benefit socio-economically from the related growth in the economy apart from improved environmental conditions of city.

231. The potential adverse environmental impacts are mainly related to the construction period, which can be minimized by the mitigation measures and environmentally sound engineering and construction practices. Once the new system is operating, the facilities will operate with routine maintenance, which should not affect the environment. Improved system operation will comply with the operation and maintenance manual and standard operating procedures to be developed for all the activities.

232. Therefore, as per ADB SPS, the project is classified as environmental category B and does not require further environmental impact assessment.

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

- Obtain all statutory clearances at the earliest time possible and ensure conditions/provisions are incorporated in the detailed design;
- Obtain Forest Diversion Permission from Forest Department;
- Include this IEE in bid and contract documents;
- Commitment from PMU, PIUs, project consultants, and contractors to protect the environment and the people from any impact during project implementation
- Update/revise this IEE based on detailed design and/or if there are unanticipated impacts, change in scope, alignment, or location;
- Conduct safeguards induction to the contractor after award of contract;
- Ensure contractor appointed qualified environment, health and safety (EHS) officers prior to start of works;
- Timely disclosure of information and establishment of GRM;
- Involvement of contractors, including subcontractors, in first level GRM;
- Ensure that the project sites are cleared of solid waste and disposed in designated disposal sites per Solid Waste Management Rules 2000 and its amendment
- Adapt site-specific health and safety measures; sites/facilities at the existing pumping stations present harmful conditions for the workers due to accumulated wastewater and solid waste, proper measures shall be implementedStrictly supervise EMP implementation;
- Continuous consultations with stakeholders;
- Urban local body will ensure that no industrial wastewater and sewerage enter in to proposed drains
- Documentation and reporting on a regular basis as indicated in the IEE.

Appendix 1: REA Check list

Instructions:
The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer. This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB checklists and handbooks on (i) involuntary resettlement, (ii) indigenous peoples planning, (iii) poverty reduction, (iv) participation, and (v) gender and development. Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: India/Rajasthan Secondary Towns Development Investment Program (RSTDP)/Ratangarh Drainage subproject, Distt. Churu, Rajasthan
Sector Division: Urban Development

REA Checklist- Urban Development

SCREENING QUESTIONS	Yes	No	REMARKS
A. **Project Siting** Is the project area…			
Densely populated?	√		Subproject activities are scattered to entire town including the densely populated areas.
Heavy with development activities?	√		Ratangarh is a developed town with continuous urban expansion, there are several industries and mostly agriculture, business and service are the common occupations
Adjacent to or within any environmentally sensitive areas?		√	There are no environmental sensitive areas near the proposed sites. The nearest protected area is Tal Chhapar wildlife sanctuary at 33 km distance in south-west.
Cultural heritage site		√	There are no ASI or state protected monuments within the project influence zone. The nearest ASI monuments is Harshnath Temple on Harsh Hill in Sikar at 83 km distance in south-east direction, and the nearest state protected monuments is Fatehpur Fort in Fatehpur Town at 32 km distance in south-east direction.
Protected Area	√		There is no ecological protected areas within 10 km radius. The nearest protected area is Tal Chhapar Sanctuary at 33 km aerial distance in south-west direction.
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	
Special area for protecting biodiversity		√	There is no Special area for protecting biodiversity.

SCREENING QUESTIONS	Yes	No	REMARKS
Bay		√	
B. Potential Environmental Impacts Will the Project cause…			
Impacts on the sustainability of associated sanitation and solid waste disposal systems and their interactions with other urban services.		√	No such impacts on existing sanitation and solid waste disposal systems
Deterioration of surrounding environmental conditions due to rapid urban population growth, commercial and industrial activity, and increased waste generation to the point that both manmade and natural systems are overloaded and the capacities to manage these systems are overwhelmed?		√	No such impact is anticipated
Degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?		√	No impacts on land and ecosystem is anticipated
dislocation or involuntary resettlement of people		√	Project does not involve land acquisition / involuntary resettlement /displacement. During the sewer construction, particularly in narrow streets there may be temporary disruption to household and there will also be temporary loss of livelihood to roadside vendors, the same is addressed in the Resettlement Plan.
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	No such impact on vulnerable groups
Degradation of cultural property, and loss of cultural heritage and tourism revenues?		√	There will be no impact on any cultural property, heritage and tourism revenues
Occupation of low-lying lands, floodplains, and steep hillsides by squatters and low-income groups, and their exposure to increased health hazards and risks due to polluting industries?		√	No such impact is anticipated
Water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and ground water quality, and pollution of receiving waters?		√	No such impact is anticipated rather proposed improvements of both drains will improve the environmental conditions of the city
Air pollution due to urban emissions?		√	No such impact is anticipated

SCREENING QUESTIONS	Yes	No	REMARKS
Risks and vulnerabilities related to occupational health and safety due to physical, chemical, and biological hazards during project construction and operation?	√		Occupational health and safety risks are negligible due to chemical and biological hazards during construction in sewerage works, physical hazards may arise due to safety risks during construction works. During operation of drainage system physical and biological hazards may cause health and safety risks to workers for which mitigation measures will be required
Road blocking and temporary flooding due to land excavation during rainy season?	√		Temporary flooding may occur in excavated trenches during rainy season and mitigation measures will be required to overcome flooding due to construction works
Noise and dust from construction activities?	√		Noise and dust problem may occur during construction activities
Traffic disturbances due to construction material transport and wastes?	√		Traffic disturbances may occur during construction works and traffic management plan will be required
Temporary silt runoff due to construction?	√		Ratangarh Town is predominantly dry and rainfall is very limited
Water depletion and/or degradation?		√	No such impact is anticipated
Overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?		√	No such impact is anticipated
Contamination of surface and ground waters due to sludge disposal on land?	√		Silt and solid waste emerging from cleaning of drains will create such problem if not addressed
Pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?		√	No such impact is anticipated
Large population influx during project construction and operation that causes increased burden on social infrastructure (such as sanitation system)?		√	Most of the unskilled workers will be hired locally, some of skilled workers will be brought from outside but numbers will not so large to have impacts on social infrastructure and services.
Social conflicts if workers from other regions or countries are hired?		√	The contractor will be utilizing the local labour force as far as possible; in case if it is necessary, labour camps and facilities will be provided appropriately. No conflicts envisaged
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 construction and operation?		√	No explosives shall be used in project. Fuel and other chemicals will be used in very less quantities which will not have significant impact on community health and safety. Safe handling of fuels and chemicals will be ensured by contractor.

SCREENING QUESTIONS	Yes	No	REMARKS
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?	√		Community safety risk may be there during construction during excavation, equipment and vehicle operation, construction etc. for which mitigation measures will be required by contractor

Checklist for Preliminary Climate Risk Screening

Country/Project Title: India/Rajasthan Secondary Towns Development Investment Program (RSTDP), Ratangarh Drainage subproject, District - Churu , Rajasthan

Sector: Urban Development

Subsector: Urban Drainage

Division/Department: SARD/SAUW

Screening Questions		Score	Remarks[29]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	No such issue may affect the project
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	No such issue may affect the project
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	No such issues may affect the project
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	No such issue may affect the project
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	No problem will envisaged in future which likely affect the performance of project output

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

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

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

Result of Initial Screening (Low, Medium, High): Low

Other Comments: The proposed subproject activity involves construction of 6 nos. SWPS and 3 nos. Disposal Points and the anticipated environmental impacts are very marginal and the construction activity does not impose any threat to the existing climatic conditions.

Appendix 2: Details of under construction Ratangarh Sewerage subproject Details

Proposed subproject components include: (i) 144.33 km of sewer network (200-700 mm diameter), including manholes & 13.66 km trenchless, (ii) house sewer connections –13,100 numbers, (iii) two Sewage Pumping Stations (SPS) of capacity – 3.80 MLD and 4.60 MLD, (iv) Construct 2 nos.of sewage pumping mains with 3.5 km total length (400mm and 450mm diameter of DI K9 material) (v) two Sewage Treatment Plants (STP) of capacity – 3.80 MLD and 6.10 MLD based on sequential batch reactor (SBR) process, (vi) two treated effluent storage reservoirs (TESR) of capacity 300 KL and 190 KL, (vii) two treated effluent elevated reservoirs (TEER) of capacity 610 KL and 380 KL with 22 m staging, (viii) outfall sewers from STPs to discharge point, to discharge excess/unused treated effluent, (ix) Construction of two buildings of CRMC- CRMC-1 at Nagar Palika Office Campus and CRMC-2 near proposed SPS site at Main Ginani in Kadwaria Bas location (x) mobile tankers (3500 Ltrs capacity) with suction and discharge arrangements to collect and convey septage from septic tanks in FSSM covered area.

Cumulative Progress of Works up to 31.03.2022

<table>
<tr><th>Contract description</th><th>Cumulative Progress of works up to 31.03.2022</th></tr>
<tr><td>Package no - RSTDIP/RTG -FTP-LXG/01

Works under package- Construction of Works of Water Supply Distribution Network Improvements with House service connections for non revenue water reduction; Continuous pressurized water supply and operation services of the entire system for 10 years at Laxmangarh (Sikar)

Name of Contractor- M/s-Larsen&</td><td>Sewerage Work:
<table>
<tr><th>Item</th><th>Scope</th><th>Progress</th></tr>
<tr><td>STP (2 No.)</td><td>6.1 MLD at Gaushala (6.75 % physical progress)

3.8 MLD Near NH-11 (39.20% physical progress)</td><td>• 6.1 MLD STP- SBR- PCC completed, TEER-Raft concrete completed. Work stopped by High Court stay order. Next hearing date 06.04.2022.
• 3.80 MLD STP – SBR: Casting of walls 5th lift completed. Center wall 5th lift completed. Casting & Shuttering for next wall is in progress.97% Civil work completed.
• TEER: Top Dome casting completed. Painting and Finishing work are under progress.100% Civil work completed.
• Admin Building: 1st floor brick work completed. 2nd floor Brick work & 1st floor Plaster work are under progress.
• PTU: Wall Casting & Shuttering work is in progress.
• Guard Room: Column casting & Shuttering work is in progress.</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Contract description</th><th>Cumulative Progress of works up to 31.03.2022</th></tr>
<tr><td>Toubro Limited

Contract type- Design, Build and Operate

Date of Start- 22.06.2020

Cumulative Financial Progress- 44.33 %

Cumulative Physical Progress-40 %

Stipulated Date of completion of Design Build- 21.06.2023</td><td>
<table>
<tr><td></td><td></td><td>• L&T is instructed to increase the manpower for speedup of works</td></tr>
<tr><td>SPS (2 No.)</td><td>3.8 MLD BSNL Office (35.50% physical progress)

4.6 MLD near Main Ginani (20.0 % Physical progress)</td><td>• 3.8 MLD SPS, BSNL Office: SUMP: Top slab Casting completed and finishing work is in progress. 95% Civil work completed.
• Ancillary Building: 1st floor Slab casting completed. Brick Work is under progress.
Guard Room: - Slab Completed and Brick work is in progress.
• 4.60 MLD SPS: SUMP: 9th lift casting completed. Work is in progress. 65% Civil work completed.
Metering Room: Column work is in progress. L&T is instructed to increase the manpower for speedup of works.</td></tr>
<tr><td>Lateral sewer (upto dia 300)</td><td>145.317 KM</td><td>• Supply: 111.98 Km
• Laid:- 88.23 Km
• Hydro Testing: 80.34 Km</td></tr>
<tr><td>Outfall RCC Pipe</td><td>1.82 KM</td><td>• Supply: -Nil
• Laid: -Nil</td></tr>
<tr><td>PVC-U pipe(110 & 160 mm dia)</td><td>143 KM</td><td>• Supply: -76.59km
• Laid:-26.06 km</td></tr>
<tr><td>Manholes (All types)</td><td>10173 Nos</td><td>• Installation: 3929 Nos</td></tr>
<tr><td>Inspection Chamber (A types)</td><td>14300 Nos</td><td>• Supply: 9387 Nos
• Installation:-8517 Nos</td></tr>
<tr><td>HDPE pipe (PE 100,PN 6) Trenchless</td><td>11.72 KM</td><td>• Supply: 10.477 Km
• Laid: - 8.328 Km</td></tr>
<tr><td>D.I K-9 Pipes (Pumping Main)</td><td>3.50 KM</td><td>• Supply: - 2.80 Km
• Laid: 0.831 Km</td></tr>
<tr><td>D.I K7 Pipes</td><td>3.50 KM</td><td>• Supply: Nil
• Laid: Nil</td></tr>
</table>
For Road Cutting & Restoration-
<table>
<tr><th>Road cutting</th><th>Road restoration Base Layer</th><th>Road restoration Top Layer</th></tr>
<tr><td>• Kuccha: -9.177 Km
• CC-23.090 Km
• BT-46.603Km
• Interlock -10.188 Km
• Total -89.058 km</td><td>• Kuccha: -9.177 Km
• CC-23.087 Km
• BT-46.440Km
• Interlock -10.186 Km
Total – 88.889 km</td><td>• Kuccha: -9.177 Km
• CC-23.087 Km
• BT-40.950 Km
• Interlock -10.184 Km
• Total -83.398 km</td></tr>
</table>
Building and Miscellaneous work
</td></tr>
</table>

Contract description	Cumulative Progress of works up to 31.03.2022		
	Item Description	**Scope of Work**	**Progress made so far**
	CRMC Building	2 Nos. (Near Nagar Palika& Ginani)	**CRMC-1** (Nagara Palika): -Plinth beam completed, Columns and Brickwork for wall is under construction. Lintel & sun shade shuttering work is going on. L & T is instructed to speedup of works. **CRMC-2:** Land is identified but unavailability of EO, Nagar Palika, NOC from Nagar Palika is awaited.

Appendix 3: Compliance with Environmental Criteria for Subproject Selection

Components	Criteria	Compliance
All subprojects		
	Subproject will avoid potentially significant adverse impacts that are diverse, irreversible or unprecedented (ADB SPS Category A for environment).	Complied- Sub project is not having significant adverse impacts, anticipated impacts are temporary and reversible and can be mitigated through mitigation plans suggested in IEE
	Comply with all requirements of ADB SPS 2009 and follow procedures set in this EARF.	Complied- Sub project complies all the requirements of ADB SPS 2009
	Comply with relevant national, and local laws, rules and regulations regarding EIA, environmental protection, pollution prevention (water, air, noise, solid waste, etc.), wildlife protection, core labor standards, physical cultural resources, health and safety, and other laws in specific sectors as indicated below	Complied- Sub project complies all relevant national and local laws, rules and regulations applicable to this type of sub projects
	Reflect inputs from public consultations	Complied- Stakeholder's consultations are conducted in the project planning phase and suggestions are incorporated in project designs
Location	Avoid involuntary resettlement by prioritizing rehabilitation over new construction using vacant government land where possible, and taking all possible measures in design and selection of site or alignment to avoid resettlement impacts	Complied- All components of sub project are planned on government land only. No land acquisition is done to avoid any involuntary resettlement.
	Avoid or minimize the cutting of trees	Will be Complied- Tree cutting will avoided as far as possible and if tree cutting is unavoidable, it has been minimized to lowest level and If any tree cutting is required for construction works, prior permission from local administration for tree cutting will be required and compensatory plantation as per RUDSICO-EAP policy will also be required
Biodiversity	Avoid locating subprojects in critical habitats, such as, but not limited to, wildlife/bird sanctuaries, national parks, tiger reserves, elephant reserves, conservation reserves or core zone of biosphere reserves. **Appendix 8** provides preliminary analysis using the International Biodiversity Assessment Tool (IBAT) key biodiversity areas, protected areas, IUCN red list species and likelihood of critical habitats per town.	Not applicable- There are no any environmentally protected areas, core zones of biosphere reserves and highly valued habitat within the impact area of project components.

	Should not directly affect environmentally protected areas, core zones of biosphere reserves and highly valued habitat	
	If work is proposed with the aim of improving the conservation or management of designated subproject sites (e.g. improved drainage), this must only be undertaken: (i) after a comprehensive study and development of management plans and criteria; and (ii) with the direct involvement and approval of national and local bodies responsible for the subproject site.	Not applicable
Physical Cultural Resources	Should not result in the destruction/damage of or encroachment onto physical cultural resources (PCR) [30] such as archaeological monuments; heritage sites and movable or immovable objects, sites, structures, group of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance.	Being Complied- Mandore Fort is ASI protected monument in Ratangarh but none of the project area falls under prohibited (100 mts) or regulated (100-200 mts) areas of this fort. No other ASI Monuments falls under impact area of any of the component of this project. None of project components falls within the protected areas of any of the state protected monuments. Therefore, there will be no adverse impact on any ASI and State protected monuments due to proposed project activity.
Existing Facilities to be rehabilitated or expanded	Conduct environmental audit of existing facilities[33] per ADB SPS	Not applicable to this sub project
Associated Facilities[31]	Analyze environmental impacts and risks to be included in the IEE	Not applicable to this sub project
Asbestos-containing materials (ACM) including, but not limited to, pipes, roofing,	Avoid handling or removing any ACM. Ensure asbestos concrete (AC) pipes facilities containing asbestos will not be disturbed and left in-situ. **Appendix C-20** (of EARF) provides asbestos management plan. RUDSICO shall include AMP in all contracts.	Not applicable to this sub project

[30] Physical cultural resources as defined as "movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings and may be above or below ground or under water. Their cultural interest may be at the local, provincial, national, or international level."

[31] ADB SPS Appendix 1 para 6 defines associated facilities as "not funded as part of the project (funding may be provided separately by the borrower/client or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project"

ceilings, insulation materials, excess pipes stored in PHED campuses, walls, etc.		
	When designing subproject infrastructure that involves excavation in urban areas the relevant authorities must be consulted to ascertain the location of any ACM prior to any subproject activity. Locations of new infrastructure must then be designed to avoid excavating or disturbing any ACM.	Not applicable to this sub project
Right-of-way	Locate water supply pipelines within the right of way (ROW) of other linear structures (roads, irrigation canals) as far as possible, to reduce new land acquisition.	Not applicable to this sub project
	Ensure that pipelines ROW do not require land acquisition from individual farmers that is a significant proportion of their total land holding (>10%).	Not applicable to this sub project

Appendix 4: Summary and Outcome of Public Consultations

Sr. No.	Date of Consultation and Location	Participants (M/F)	Stakeholder	Topic Discussed	Issues Raised and Key Mitigation Measures
1	05.05.2022 at office cum residence of Chairman, NP-Ratangarh	Total=02, Male-01, Female-01	Chairman of Nagar Palika, Ratangarh	• Prevailing status of sanitation and sewerage system • Need of the Subproject • Briefing on subproject objectives • Potential positive and negative impacts due to project implementation • If impact on livelihood. • Inconvenience to public.	• Participants have shown their willingness and support subproject storm water drainage because water logged during rainy seasons in low areas. Remodelling of drainage system is required • Temporary impacts: No interruption in commercial activity, breakage of other utility line, safety for pedestrian etc. • Improvement in environment, health and hygiene etc. • Any unanticipated impact, will be compensated as per Entitlement Matrix.
2	05.05.2022 at Parmana Tal, Ratangarh	Total=08, Male-08, Female-00	Residents residing near proposed existing and Proposed SWPS, Parmana Tal	• Prevailing status of sanitation and sewerage system • Need of the Subproject • Briefing on subproject objectives • Potential positive and negative impacts due to project implementation • If impact on livelihood. • Inconvenience to public.	• Participants have shown their willingness and support subproject storm water drainage because water logged during rainy seasons in low areas. • Temporary impacts: No interruption in commercial activity, breakage of other utility line, safety for pedestrian etc. • Improvement in environment, health and hygiene etc. • Any unanticipated impact, will be compensated as per Entitlement Matrix.
3	06.05.2022 at Main Ginani, Ratangarh	Total=13, Male-08, Female-05	Residents residing near proposed existing and Proposed SWPS, Main Ginani	• Prevailing status of sanitation and sewerage system • Need of the Subproject • Briefing on subproject objectives • Potential positive and	• Participants have shown their willingness and support subproject storm water drainage because water logged during rainy seasons in low areas. • Temporary impacts: No interruption in commercial activity, breakage of other utility

Sr. No.	Date of Consultation and Location	Participants (M/F)	Stakeholder	Topic Discussed	Issues Raised and Key Mitigation Measures
				negative impacts due to project implementation • If impact on livelihood. • Inconvenience to public.	line, safety for pedestrian etc. • Improvement in environment, health and hygiene etc. • Any unanticipated impact, will be compensated as per Entitlement Matrix.
4	06.05.2022 at Railway Quarters, Ratangarh	Total=07, Male-06, Female-01	Residents residing near proposed existing and Proposed SWPS, Near Railway Quarters	• Prevailing status of sanitation and sewerage system • Need of the Subproject • Briefing on subproject objectives • Potential positive and negative impacts due to project implementation • If impact on livelihood. • Inconvenience to public.	• Participants have shown their willingness and support subproject storm water drainage because water logged during rainy seasons in low areas. • Temporary impacts: No interruption in commercial activity, breakage of other utility line, safety for pedestrian etc. • Improvement in environment, health and hygiene etc. Any unanticipated impact, will be compensated as per Entitlement Matrix.
5.	06.05.2022 at Parmana Tal, Ratangarh	Total=12, Male-05, Female-07	Residents residing near proposed existing and Proposed SWPS, Parmana Tal	• Prevailing status of sanitation and sewerage system • Need of the Subproject • Briefing on subproject objectives • Potential positive and negative impacts due to project implementation • If impact on livelihood. • Inconvenience to public.	• Participants have shown their willingness and support subproject storm water drainage because water logged during rainy seasons in low areas. • Temporary impacts: No interruption in commercial activity, breakage of other utility line, safety for pedestrian etc. • Improvement in environment, health and hygiene etc. • Any unanticipated impact, will be compensated as per Entitlement Matrix.
6	10.08.2022 at Aaganbadi Kendra, near main Ginani, Ratangarh	Total=15, Male-15, Female-0	Residents residing near proposed existing and Proposed	• Open drain/Open Nala that feed strom water into main Ginani.	• • Participants have shown their willingness and support subproject storm water drainage because

Sr. No.	Date of Consultation and Location	Participants (M/F)	Stakeholder	Topic Discussed	Issues Raised and Key Mitigation Measures
			SWPS, Ward No.9 near Main Ginani.	• Prevailing status of sanitation and sewerage system • Need of the Subproject • Briefing on subproject objectives • Potential positive and negative impacts due to project implementation • If impact on livelihood. • Inconvenience to public.	water logged during rainy seasons in low areas. • Local Ward Parsad gave his views to cover the existing main drain of main Ginani. • Temporary impacts: No interruption in commercial activity, breakage of other utility line, safety for pedestrian etc. • Improvement in environment, health and hygiene etc. • Any unanticipated impact, will be compensated as per Entitlement Matrix.
7	10.08.2022 near BNSL Ginani, Ratangarh	Total=8, Male-8, Female-0	Residents residing near proposed SWPS near BSNL Ginani.	• Existing underground pipe line in the drainage system and need of replaced the existing pipelines and pumping stations. • Prevailing status of sanitation and sewerage system • Need of the Subproject • Briefing on subproject objectives • Potential positive and negative impacts due to project implementation • If impact on livelihood. • Inconvenience to public.	• To change to existing underground pipe line in the drainage system because these line are very old and dia of these pipelines are not sufficient to pump out the storm water from Ginanies. • Participants have shown their willingness and support subproject storm water drainage because water logged during rainy seasons in low areas. • Temporary impacts: No interruption in commercial activity, breakage of other utility line, safety for pedestrian etc. • Improvement in environment, health and hygiene etc. • Any unanticipated impact, will be compensated as per Entitlement Matrix.
8	10.08.2022 near Saraf Well, Ratangarh	Total=6, Male-6, Female-0	Residents residing near Saraf Well, Ratangarh	• Capacity of existing drainage pumping station	• Water submerging condition and water borne disease during monsoon season.

Sr. No.	Date of Consultation and Location	Participants (M/F)	Stakeholder	Topic Discussed	Issues Raised and Key Mitigation Measures
				and drainage pipeline. • Existing underground pipe line in the drainage system and need of replaced the existing pipelines and pumping stations. • Prevailing status of sanitation and sewerage system • Need of the Subproject • Briefing on subproject objectives • Potential positive and negative impacts due to project implementation • If impact on livelihood. • Inconvenience to public.	• To change to existing underground pipe line in the drainage system because these line are very old and dia of these pipelines are not sufficient to pump out the storm water from Ginanies. • Participants have shown their willingness and support subproject storm water drainage because water logged during rainy seasons in low areas. • Temporary impacts: No interruption in commercial activity, breakage of other utility line, safety for pedestrian etc. • Improvement in environment, health and hygiene etc. • Any unanticipated impact, will be compensated as per Entitlement Matrix.
9	10.08.2022 near Saraf Well, Ratangarh	Total=6, Male-6, Female-0	Residents residing near Saraf Well, Ratangarh	• Capacity of existing drainage pumping station and drainage pipeline. • Existing underground pipe line in the drainage system and need of replaced the existing pipelines and pumping stations. • Prevailing status of sanitation and sewerage system	• Water submerging condition and water borne disease during monsoon season. • To change to existing underground pipe line in the drainage system because these line are very old and dia of these pipelines are not sufficient to pump out the storm water from Ginanies. • Participants have shown their willingness and support subproject storm water drainage because water logged during rainy seasons in low areas. • Temporary impacts: No interruption in

Sr. No.	Date of Consultation and Location	Participants (M/F)	Stakeholder	Topic Discussed	Issues Raised and Key Mitigation Measures
				• Need of the Subproject • Briefing on subproject objectives • Potential positive and negative impacts due to project implementation • If impact on livelihood. • Inconvenience to public.	commercial activity, breakage of other utility line, safety for pedestrian etc. • Improvement in environment, health and hygiene etc. • Any unanticipated impact, will be compensated as per Entitlement Matrix.
9	10.08.2022 near Parmanand Tal, Ratangarh	Total=4, Male-4, Female-0	Residents residing near Parmanand Tal, Ratangarh	• Prevailing status of sanitation and sewerage system • Need of the Subproject • Briefing on subproject objectives • Potential positive and negative impacts due to project implementation • If impact on livelihood. • Inconvenience to public.	• Water submerging Temporary impacts: No interruption in commercial activity, breakage of other utility line, safety for pedestrian etc. • Improvement in environment, health and hygiene etc. • Any unanticipated impact, will be compensated as per Entitlement Matrix.

A. Stakeholder Meeting with Chainman Nagar Palika (Mrs. Archana Sarsawat) and elected ward members, Ratangarh:-

A stakeholder consultation was conducted on 06.05.2022 with Chainman Nagar Palika and discussed following issues:-

- Need of drainage subproject for the Ratangarh Town.
- Ownership of land required for proposed component of subproject.
- Old drainage system of Ratangarh Town.
- Existing Pumping station drainage in the Ratangarh Town.
- Photo of **Stakeholder Meeting with Chainman Nagar Palika** is given below:-

B. Stakeholder Meeting with Forest Range Office, Ratangarh :-

2. A Meeting was arranged with Forest Range Office, Ratangarh and discussion about forest area distribution in Ratangarh and presence of forest area at proposed subproject component locations : Rising Main Pipe laye from SWPS-4 to Disposal Point 3 . This forest land is protected forest (Kasba Ratangarh forest) land. Proposed Rising Main line (from SWPS 1&2 to Disposal Point 1) crosses the notified protected forest existed along NH-52 (Old No. NH-11) near the railway under pass. Road side Plantation of NH-52 (Old No. NH-11) is declared as notified Protected Forest. Thus, forest diversion is applicable for proposed Disposal Point 1, Rising Main Pipe Line from SWPS-4 to Disposal Point No. 1 and NH-52 crossing near railway under pass (Ratangarh) etc.

Details of Consultation with Forest Dept

S. No.	Name & Designation of Stock Holder (Govt. Officials)	Mode of Interaction and Venue	Point of Discussion	Findings
1.	**Name**:- Mr. Naresh Purohit, Forest Range Officer Ratangarh **Mobile No**. 9413936574 **Name:**- Mr. Vinod Kumar, Ranger Ratangarh **Mobile No.** 7665499600	**Mode:**- By Personal Interaction **Place:**- Forest Range Officer, Ratangarh Date:- 25th and 26th July, 2022	Distribution of forest areas in Ratangarh RUIDP-IV Ratangarh Drainage Subproject Component Locations. Notified Protected Forest along NH-52 (Old No. NH-11). ROW of NH-52.	Forest diversion is applicable for proposed SWPS-4, Disposal Point 3, Rising Main Pipe Line from SWPS-4 to Disposal Point No. 1 and NH-52 crossing near railway under pass (Ratangarh)

Government of Rajasthan
Office of The Executive Engineer
Rajasthan Urban Infrastructure Development Project
Project Implementation Unit (RSTDIP, Ph-IV), Ratangarh
(E-3 Block, Sangam Vihar Colony, Salasar Road, Ratangarh, Churu)
TEL: 01567-294440
Email- rtg.ruidp@rajasthan.gov.in

S. No. /RUIDP/PIU/RTG/2022-23/ 1224 Dated: 20/5/22

Minutes of CLC meeting held on dated 12.05.2022 for Drainage Project at Ratangarh town (Churu) under RUIDP Phase-IV

A City Level Committee (CLC) meeting was held under the chairmanship of District Collector, Churu on dated 12.05.2022 to discuss the Drainage works proposed for Ratangarh Town under RUIDP Phase-IV. List of members/officers attended the meeting is enclosed as **Annexure-A**

1. It was apprised that the Detailed Project Report (DPR) of Drainage Project is Prepared by the Consultant M/s Creative Technocrate Services Pvt. Ltd. Jaipur engaged by the Municipal Board Ratangarh (Churu), Which will be considered under RUIDP Phase-IV. RUIDP has scrutinized the Draft DPR and suggestions have already been conveyed to consultant for modification & revised the estimate as per RUIDP SOR - 2017 updated to 2022.

2. The basic scope of works & provision in DPR were briefed to the committee. The estimated cost of DPR is of about Rs 33.11 Cr for works proposed under Drainage sector including 5 years O&M cost. The capital cost for execution of works will be borne by State Govt financed by ADB under RUIDP phase IV. The O&M cost for Drainage works (SWPS, RWR & Rising Line) is to be borne by Municipal Board as per actual basis along with power charges.:

3. The brief scope of Drainage Work is:
   i) Construction of Six Storm Water Pumping Station (SWPS) at Near Railway Quarter (1.1 MLD), Near Saraf Sump Well (2.3 MLD), Near Parmana Taal (4.6 MLD), Near Main Ganani (10MLD), Near BSNL office (10 MLD) and Near Hanuman Park (1.1 MLD)
   ii) Laying of about 10.13 km length rising main line (DI -K9) from SWPS to end disposal point i.e. three RWR's.
   iii) Construction of three no. RWR's at different three locations Disposal point 1 (Nagar Palika Land / Gaoshala land near Mega Highway Sardarshahar), Disposal point-2 (in Forest/ Govt. Land near 220 KV GSS) & Disposal point 3 (Nagar Palika Land) on Jaipur – Bikaner highway.

4. Municipal Board, Ratangarh informed that land is available for construction of all six SWPS and three RWR, Municipal Board officials instructed to hand over required land at the time of construction of above structures.

5. In the meeting it was pointed out by public representative for covering of open drain between Ramchandra park to Main Ginani, providing of manual screen at start and end point of this drain and providing manhole at regular interval for it cleaning. It is

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(E-3 Block, Sangam Vihar Colony, Salasar Road, Ratangarh, Churu)
TEL: 01567-294440
Email- rtg.ruidp@rajasthan.gov.in

S. No. /RUIDP/PIU/RTG/2022-23/ Dated:

conveyed to CLC that the consultant M/s Creative Technocrate Services Pvt. Ltd. Jaipur will carry out the detailed survey & engineering of above drain and submit its report to Municipal Board, Ratangarh to take appropriate action in Municipal Board work.

6. It was also deliberated that works shall be done in planned manner to avoid any inconvenience to public.

7. After completion of project works, the adequate capacity will be developed to takeout storm water from the town and overcome the flooding of town during rainy season.

Suggestions and directions of the City Level Committee (CLC) will be incorporated in the detail project report. The project was agreed by the committee for further course of action at RUIDP level. Meeting ended with vote of thanks to the chair

(K. K. Agarwal)
Superintending Engineer
Member Secretary, CLC
RUIDP, Ratangarh

No RUIDP/PIU/CLC/RTG/2022-23/ 1225-35 Dated: 20/5/22

Copy to the following for information and necessary action:

1. The PA to Hon'ble MP, Churu
2. The PA to Hon'ble MLA, Ratangarh
3. The Project Director, RUIDP, Jaipur
4. The District Collector, Chairman CLC, Churu
5. The Chairman, Municipal Board, Ratangarh.
6. The Add. Project Director/Chief Engineer/Addl chief Engineer, RUIDP, Jaipur
7. Superintending Engineer (DR), RUIDP, Jaipur.
8. Superintending Engineer, PHED/PWD/WRD, Churu/Ratangarh.
9. Executive Engineer, PWD/PHED, Ratangarh
10. Executive Officer, Municipal Board, Ratangarh.
11. District Town planner, Town Planning Department, Churu.

(K. K. Agarwal)
Superintending Engineer
Member Secretary, CLC
RUIDP, Ratangarh

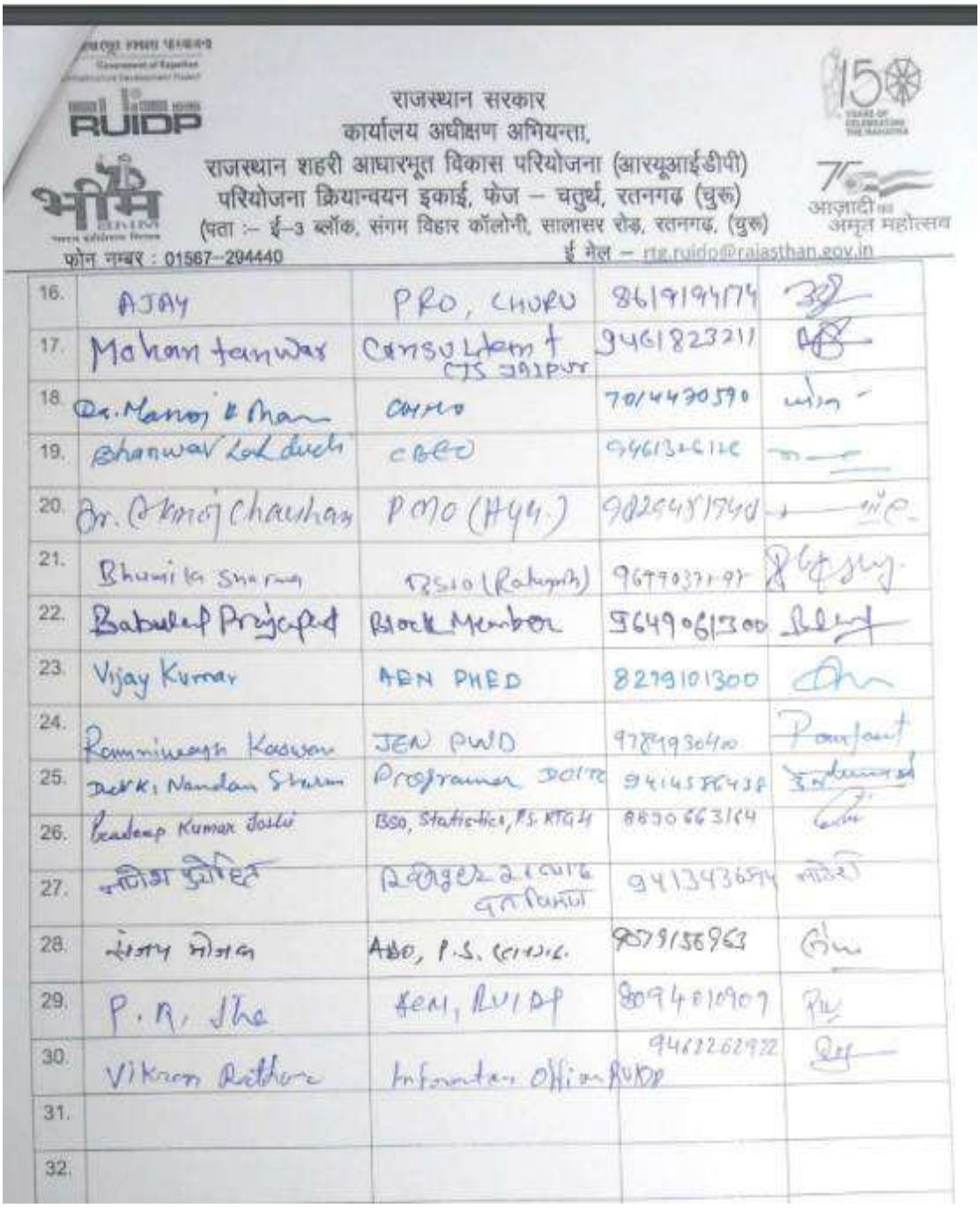
Attendance Sheet of CLC Meeting

राजस्थान सरकार
कार्यालय अधीक्षण अभियन्ता,
राजस्थान शहरी आधारभूत विकास परियोजना (आरयूआईडीपी)
परियोजना क्रियान्वयन इकाई, फेज – चतुर्थ, रतनगढ़ (चुरू)
(पता – ई–3 ब्लॉक, सरगम विहार कॉलोनी, सालासर रोड, रतनगढ़, (चुरू)
फोन नम्बर : 01567–294440 ई मेल – rte.ruidp@rajasthan.gov.in

उपस्थिति पंजीयन

रतनगढ़ शहर में आर.यू.आई.डी.पी. फेज चतुर्थ के कार्यों के अन्तर्गत ड्रेनेज कार्य के संबन्ध में सिटी लेवल कमेटी की बैठक पंचायत समिति सभागार, रतनगढ़ में आयोजित दिनांक 12 मई 2022 को 10:30 बजे:–

क्र. सं.	नाम	पद नाम	मोबाईल नं.	हस्ताक्षर
01.	श्रीमान् राहुल कस्वां	माननीय सांसद महोदय, चूरू		
02.	श्रीमान् अभिनेष महर्षि	माननीय विधायक, रतनगढ़	9610177777	
03.	श्रीमान् सिद्धार्थ सिहाग	जिला कलक्टर, चूरू		
04.	डॉ. [illegible]	[illegible]	[illegible]	
05.	[illegible]	ADM [illegible]	[illegible]	
06.	[illegible]	SDM [illegible]	[illegible]	
07.	K. K. Agarwal	SE RUIDP RTN.		
08.	DV HARMEENA	SVO	9982036717	
09.	[illegible]	E.O [illegible]	[illegible]	
10.	[illegible]	CDPO	8952066483	
11.	[illegible]	XEn JdVVNL	94133-59753	
12.	[illegible]	[illegible]	[illegible]	
13.	Dasharath Ram	Exen, PHED Apni Yojna	9828250070	
14.	R. L. Choudhary	Consultant CTE Jaipur	99280 95062	
15.	Aman Singh Meena	EE PHED RTGH	9929391517	



राजस्थान सरकार
कार्यालय अधीक्षण अभियन्ता,
राजस्थान शहरी आधारभूत विकास परियोजना (आरयूआईडीपी)
परियोजना क्रियान्वयन इकाई, फेज – चतुर्थ, रतनगढ़ (चुरू)
(पता :– ई–3 ब्लॉक, संगम विहार कॉलोनी, सालासर रोड़, रतनगढ़, (चुरू)
फोन नम्बर : 01567–294440
ई मेल – rte.ruidp@rajasthan.gov.in

16.	AJAY	PRO, CHURU	8619194174	
17.	Mohan tanwar	Consultant CTS JAIPUR	9461823211	
18.	Dr. Manoj K Mar	CMHO	7014430590	
19.	Bhanwar Lal Dudi	CBEO	9461326116	
20.	Dr. Manoj Chauhan	PMO (HQ.)	9829451748	
21.	Bhumika Sharma	TSIO (Rajgarh)	9649037197	
22.	Babulal Prajapat	Block Member	9649061300	
23.	Vijay Kumar	AEN PHED	8279101300	
24.	Ramniwas Kasyap	JEN PWD	9784936400	
25.	Dr. K. Nandan Sharma	Programmer DOIT&C	9414586438	
26.	Pradeep Kumar Joshi	BSO, Statistics, P.S. RTG-4	8890663164	
27.	नरेश पुरोहित	[illegible]	9413436594	
28.	[illegible]	ABO, P.S. [illegible]	9079158963	
29.	P. R. Jha	XEN, RUIDP	8094810907	
30.	Vikram Rathore	Information Officer RUIDP	9462262922	
31.				
32.				

Photographs of CLC Meeting




Public Consultation: Photos and Signature Sheet

1. 05.05.2022 at office cum residence of Chairman, NP-Ratangarh

Rajasthan Secondary Towns Development Sector Project (RSTDSP)

RUIDP Phase-IV

Consultation Sheet

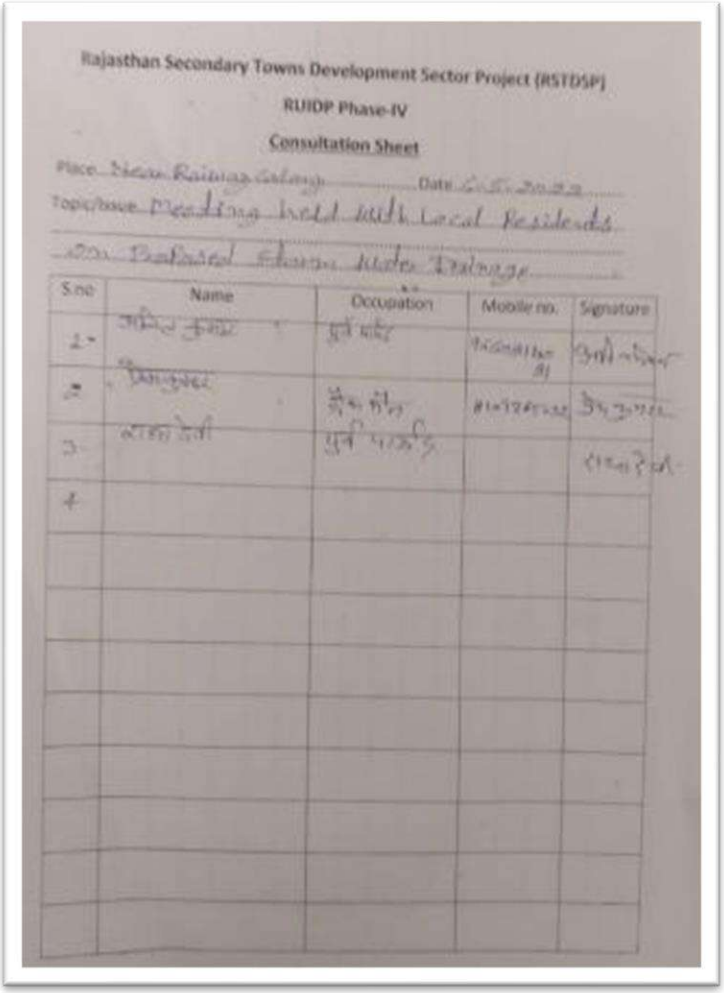
Place Parmana Taal Near Chungi Date 05-05-2022

Topic/Issue meeting held with Local Residents on proposed storm water drainage

S.no	Name	Occupation	Mobile no.	Signature

2. 05.05.2022 at Parmana Tal, Ratangarh

3. 06.05.2022 at Main Ginani, Ratangarh



Rajasthan Secondary Towns Development Sector Project (RSTDSP)

RUIDP Phase-IV

Consultation Sheet

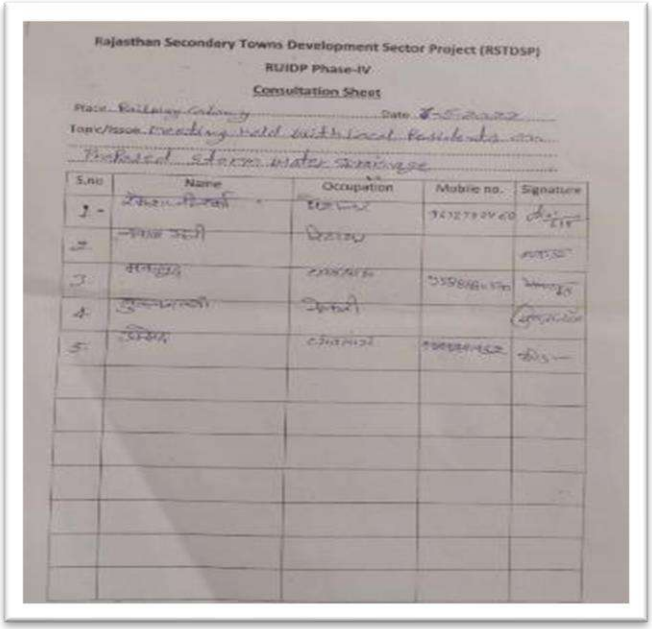
Place: New Railway Colony Date: 6.5.2022

Topic/Issue: Meeting held with Local Residents

for Proposed Storm Water Drainage

S.no	Name	Occupation	Mobile no.	Signature
1-				
2-				
3-				
4				

4. 06.05.2022 at Railway Quarters, Ratangarh



Rajasthan Secondary Towns Development Sector Project (RSTDSP)

RUIDP Phase-IV

Consultation Sheet

S.no	Name	Occupation	Mobile no.	Signature
1.				
2.				
3.				
4.				
5.				

5. 06.05.2022 at Parmana Tal, Ratangarh

6. 10.08.2022 at Aaganbadi Kendra, near main Ginani, Ratangarh

1. 10.08.2022 near BNSL Ginani, Ratangarh

2. 10.08.2022 near Saraf Well, Ratangarh

3. 10.08.2022 near Parmanand Tal, Ratangarh

Appendix 5: Environmental Monitoring Plan - Ambient Air, Noise, Water and Soil

1. Under RSTDSP works Environmental Monitoring will done for ambient air, noise, and soils with following parameters-

A. **Ambient Air Quality-** Particulate Matters PM_{10}, Particulate Matter $PM_{2.5}$, SO_x, NO_x, Carbon Monoxide (CO) as per methods and norms approved by CPCB
B. **Ambient Noise Quality-** L_{day} and L_{night} (in Leq dBA) 24 hrs basis as per methods and norms approved by CPCB

2. During pre-construction stage monitoring is required to establish baseline at following sites-

Environmental Monitoring Locations and required samples

S.N.	Type of monitoring	Location of monitoring and no. of samples	Total No. of samples
1	Ambient Air Monitoring	7 locations SWPS No. 5/2/1, 6, 4, 3, Disposal Point No.1, 2 &3.	35
2.	Ambient Noise monitoring	7 locations SWPS No. 5/2/1, 6, 4, 3, Disposal Point No.1, 2 &3.	35
3.	Ground Water	7 locations SWPS No. 5/2/1, 6, 4, 3, Disposal Point No.1, 2 &3.	35
4.	Soil Monitoring	7 locations SWPS No. 5/2/1, 6, 4, 3, Disposal Point No.1, 2 &3.	35

3. During pre-construction and construction stage below monitoring should be done on minimum quarterly basis at the following sites-

Environmental Monitoring in Construction Period

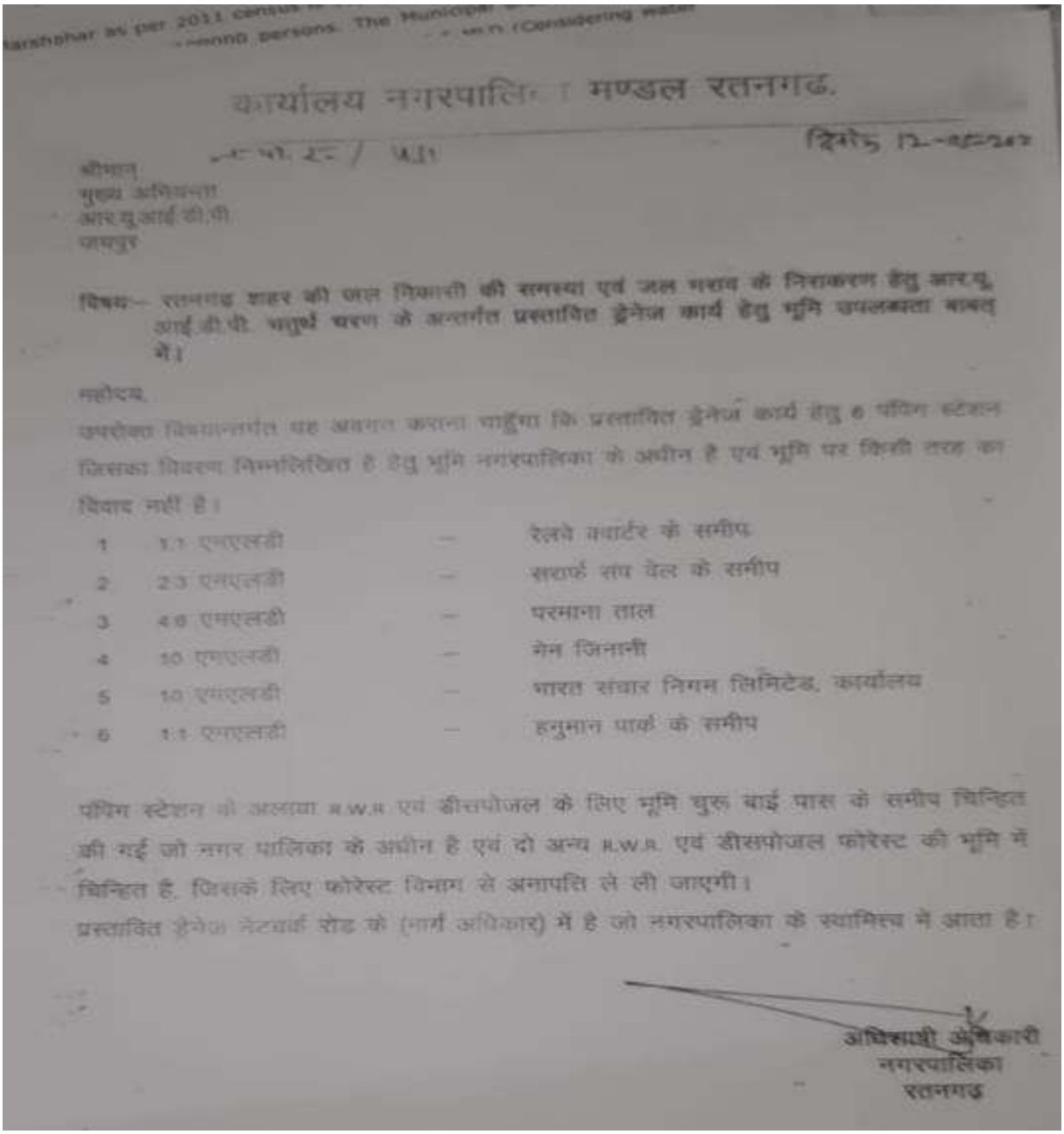
Proposed sites	Ambient Air quality	Ambient Noise quality	Ground Water Quality	Soil Monitoring
SWPS No. 5/2/1, 6, 4, 3, Disposal Point No.1, 2 &3.	7	7	7	7
Total number of samples in each quarter	7	7	7	7
Total number of samples in one year (excluding monsoon)	21	21	21	21
Total number of samples in construction period of 2 years	35	35	35	35

Note -

i. All the tests should be done by labs approved by CPCB and/or RSPCB and should be accredited by NABL
ii. All the tests should be done as per the norms and methods approved by CPCB/RSPCB
iii. All the meteorological data like weather, wind, location, nearby features etc. should be recorded during sampling and indicated in the report for ambient air quality
iv. For air quality monitoring, if any two sites are within the distance of 2 km from each other, only one sampling can be done at any site

* Sensitive receptors are hospitals, schools, any major religious place etc

Appendix 6: No-Objection and confirmation of Nagar Palika regarding land availability of proposed drain works



कार्यालय नगरपालिका मण्डल रतनगढ़.

दिनांक 12-

सेवा में,
मुख्य अभियन्ता
आर.यू.आई.डी.पी.
जयपुर

विषय:- रतनगढ़ शहर की जल निकासी की समस्या एवं जल भराव के निराकरण हेतु आर.यू. आई.डी.पी. चतुर्थ चरण के अन्तर्गत प्रस्तावित ड्रेनेज कार्य हेतु भूमि उपलब्धता बाबत् में।

महोदय,

उपरोक्त विषयान्तर्गत यह अवगत कराना चाहूँगा कि प्रस्तावित ड्रेनेज कार्य हेतु 6 पंपिंग स्टेशन जिसका विवरण निम्नलिखित है हेतु भूमि नगरपालिका के अधीन है एवं भूमि पर किसी तरह का विवाद नहीं है।

1	1.1 एमएलडी	—	रेलवे क्वार्टर के समीप
2	2.3 एमएलडी	—	सराफ़ संघ पेट्रोल के समीप
3	4.6 एमएलडी	—	परमाना ताल
4	10 एमएलडी	—	मेन जिनानी
5	10 एमएलडी	—	भारत संचार निगम लिमिटेड, कार्यालय
6	1.1 एमएलडी	—	हनुमान पार्क के समीप

पंपिंग स्टेशन के अलावा R.W.H एवं डीसपोजल के लिए भूमि चुरू बाई पास के समीप चिन्हित की गई जो नगर पालिका के अधीन है एवं दो अन्य R.W.H. एवं डीसपोजल फोरेस्ट की भूमि में चिन्हित है, जिसके लिए फोरेस्ट विभाग से अनापत्ति ले ली जाएगी।

प्रस्तावित ड्रेनेज नेटवर्क रोड के (मार्ग अधिकार) में है जो नगरपालिका के स्वामित्व में आता है।

अधिशाषी अधिकारी
नगरपालिका
रतनगढ़

Transcript in English
Office of Nagar Palika, Ratangarh

To,
Chief Engineer, RUIDP-Jaipur

Sub: Land availability for proposed storm water drainage subproject of Ratangrah town.

Sir,

With the above cited subject, this is confirming you that all the lands where storm water pumping stations are proposed, are under the possession of Nagar Palika, Ratnagarh and no legacy issues of any sites.

1. SwPS- 1 mld- Near Railway quarter
2. SwPS- 2.3 mld-Saraf sump well
3. SwPS-4.6 mld- Parnaman Taal
4. SwPS-10 mld- Main Ginani
5. SwPS-10 mld- BSNL office
6. SwPS-1.1 mld- Hanuman Park

In addition to pumping stations, lands for RWR and disposal points have also been identified at Churu-Sardarsahar by pass. Lands for one disposal points are comes under Nagar Palika-Ratangarh and second one is belonging to Forest department, for which permission will be obtained. Proposed networks of roads comes under Nagar Palika, Ratangarh.

Executive Officer
Nagar Palika, Ratangarh

Appendix 7: Request for No Objection Certificate From Forest Department

कार्यालय नगरपालिका रतनगढ़ (राजस्थान)

क्रमांक :– नपार/2022/ दिनांक

श्रीमान् क्षेत्रीय वन अधिकारी

रेन्ज–रतनगढ़

विषय :– **RUIDP Phase-IV** के अन्तर्गत रतनगढ़ शहर में प्रस्तावित ड्रेनेज कार्य के लिए डिस्पोजल पोईन्ट हेतु वन विभाग की भूमि चिन्हित करने बाबत।

महोदय,

उपर्युक्त विषयान्तर्गत यह अवगत करवाना चाहूंगा कि रतनगढ़ शहर में वर्तमान में ड्रेनेज का डिस्पोजल पोईन्ट नं0 02 वन विभाग की भूमि जो हाईवे के समीप है व जहां पर पूर्व में गैनाणी का पानी डिस्पोज किया जा रहा है को चिन्हित किया गया है।

अतः इस डिस्पोजल पोईन्ट हेतु अपना अनापति प्रमाण पत्र जारी कराने का श्रम करावें।

धन्यवाद।

भवदीय

ह०
अधिशाषी अधिकारी
नगरपालिका रतनगढ़

क्रमांक :– नपार/2022/1571 दिनांक 20-07-22

प्रतिलिपि :–

01. श्रीमान् अधीक्षण अभियन्ता **RUIDP** रतनगढ़ को सूचनार्थ।

अधिशाषी अधिकारी
नगरपालिका रतनगढ़

Appendix 8: Integrated Biodiversity Assessment Report (IBAT analysis) for Ratangarh

IBAT

Proximity Report

IND RSTDSP - RATANGARH STP1 NEAR NH11

Country: India

Location: [28.1, 74.6]

Date of analysis: 14 January 2020

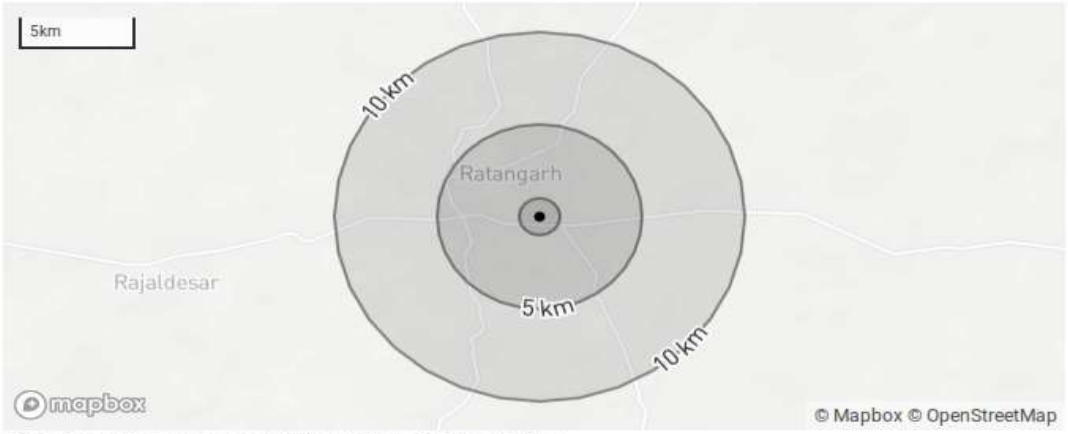
Buffers applied: 1.0 km | 5.0 km | 10.0 km

Generated by: Ninette Pajarillaga

Company/Subscriber: ADB

Overlaps with:

Protected Areas	0
Key Biodiversity Areas	0
IUCN Red List	29



Displaying project location and buffers: 1.0 km, 5.0 km, 10.0 km

IBAT

Proximity Report

IND RSTDSP - RATANGARH STP2 GAUSHALA NEAR CHURU RD

Country: India

Location: [28.1, 74.6]

Date of analysis: 14 January 2020

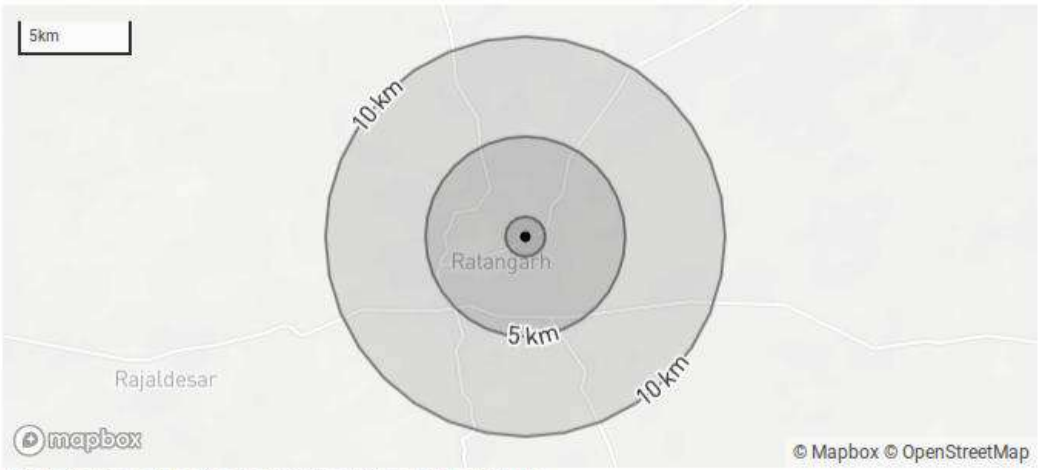
Buffers applied: 1.0 km | 5.0 km | 10.0 km

Generated by: Ninette Pajarillaga

Company/Subscriber: ADB

Overlaps with:

Protected Areas	0
Key Biodiversity Areas	0
IUCN Red List	29



Displaying project location and buffers: 1.0 km, 5.0 km, 10.0 km

IBAT

Proximity Report

IND RSTDSP - SPS1 NEAR BSNL OFFICE

Country: India

Location: [28.1, 74.6]

Date of analysis: 14 January 2020

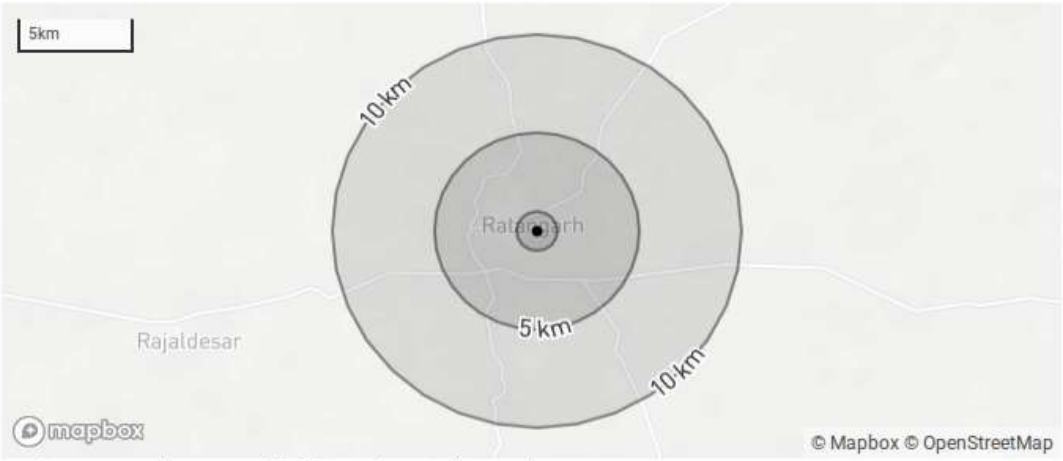
Buffers applied: 1.0 km | 5.0 km | 10.0 km

Generated by: Ninette Pajarillaga

Company/Subscriber: ADB

Overlaps with:

Protected Areas	0
Key Biodiversity Areas	0
IUCN Red List	29



Displaying project location and buffers: 1.0 km, 5.0 km, 10.0 km

IBAT

Proximity Report

IND RSTDSP - SPS2 WARD NO. 1 NEAR MAIN GINANI

Country: India

Location: [28.1, 74.6]

Date of analysis: 14 January 2020

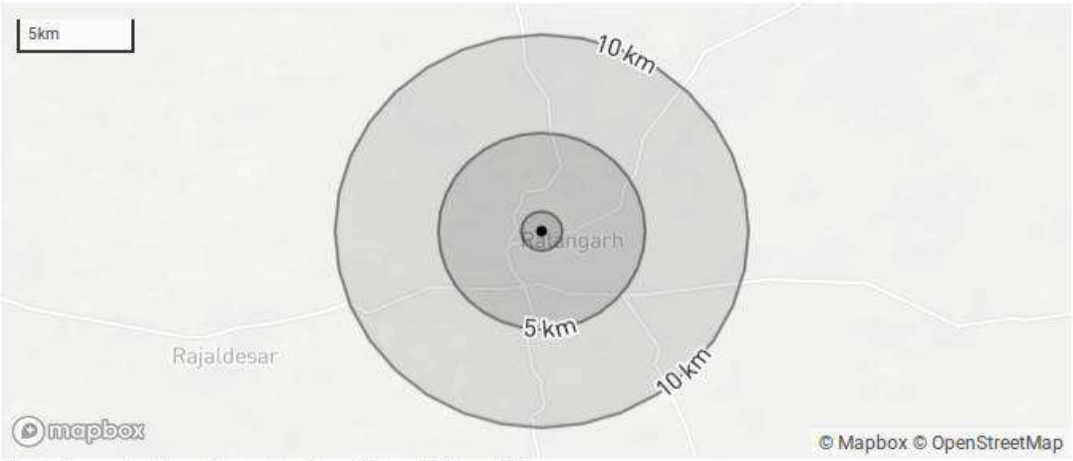
Buffers applied: 1.0 km | 5.0 km | 10.0 km

Generated by: Ninette Pajarillaga

Company/Subscriber: ADB

Overlaps with:

Protected Areas	0
Key Biodiversity Areas	0
IUCN Red List	29



Displaying project location and buffers: 1.0 km, 5.0 km, 10.0 km

Protected Areas

The following protected areas are found within 1.0 km, 5.0 km, 10.0 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

No protected areas within buffer distance

Key Biodiversity Areas

The following key biodiversity areas are found within 1.0 km, 5.0 km, 10.0 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

No KBAs within buffer distance

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	IUCN Category	Taxonomic Class
Anacyclus pyrethrum	Atlas daisy	VU	Magnoliopsida
Antigone antigone	Sarus crane	VU	Aves
Aquila heliaca	Eastern imperial eagle	VU	Aves
Aquila nipalensis	Steppe eagle	EN	Aves
Aquila rapax	Tawny eagle	VU	Aves
Ardeotis nigriceps	Great indian bustard	CR	Aves
Aythya ferina	Common pochard	VU	Aves
Chlamydotis macqueenii	Asian houbara	VU	Aves

IBAT

Species name	Common name	IUCN Category	Taxonomic Class
Ciconia episcopus	Asian woollyneck	VU	Aves
Clanga clanga	Greater spotted eagle	VU	Aves
Columba eversmanni	Yellow-eyed pigeon	VU	Aves
Crocodylus palustris	Mugger	VU	Reptilia
Falco cherrug	Saker falcon	EN	Aves
Gyps bengalensis	White-rumped vulture	CR	Aves
Gyps indicus	Indian vulture	CR	Aves
Leptoptilos dubius	Greater adjutant	EN	Aves
Lutrogale perspicillata	Smooth-coated otter	VU	Mammalia
Manis crassicaudata	Indian pangolin	EN	Mammalia
Neophron percnopterus	Egyptian vulture	EN	Aves
Oryza malampuzhaensis		VU	Liliopsida
Oxyura leucocephala	White-headed duck	EN	Aves
Panthera pardus	Leopard	VU	Mammalia
Rusa unicolor	Sambar	VU	Mammalia
Rynchops albicollis	Indian skimmer	VU	Aves
Sarcogyps calvus	Red-headed vulture	CR	Aves
Saxicola macrorhynchus	White-browed bushchat	VU	Aves
Tetracerus quadricornis	Four-horned antelope	VU	Mammalia
Vanellus gregarius	Sociable lapwing	CR	Aves
Wallago attu		VU	Actinopterygii

Appendix 9: Checklists for Transportation and Disposal of Solid Waste

Checklist-1: Generation Information

1. Date of filling Checklist-
2. Name of Town- Ratangarh
3. Place from where Solid Waste to be removed (A)-
4. Approximate quantity of solid waste present at site-
5. Place where Solid Waste to be transferred (B)-
6. Approximate area of B-
7. Approximate quantity of Solid Waste, which can be stored at B after transfer from A-
8. Mode of transportation (truck/tractor/dumper/other)-
9. How may numbers of vehicles are being used for transportation-
10. Vehicle and operator details- Provide following details-

S.No.	Name and type of vehicles	Vehicle registration number	Name of operator and valid driving licence number	Capacity of vehicle/trip	PUC number
1					
2					
3					
4					

Checklist 2: Information about transportation of Solid Waste

1. Date-
2. Vehicle no-
3. Name of operator-
4. Trip number of this vehicle today-

Loading Information		Unloading information	
Mode of loading (Manual/mechanical)		Mode of unloading (Manual/mechanical)	
How much quantity loaded of SW (approx.)		How much quantity unloaded of SW (approx.)	
Is vehicle overloaded, which may spill off		Is any sign of spill off noted	
What is state of SW (solid/semi-solid)			
What are major items in Solid Waste to be transported			
Is appropriate PPEs provided to workers/operators during loading		Is appropriate PPEs provided to workers/operators during unloading	
Is there cover provided for SW during transportation		Is cover fully tied at time of arrival	
Opening KM reading		Closing KM reading	
Time of Start		Time of end	

Total KM run in this trip-
Total Time taken in this trip-